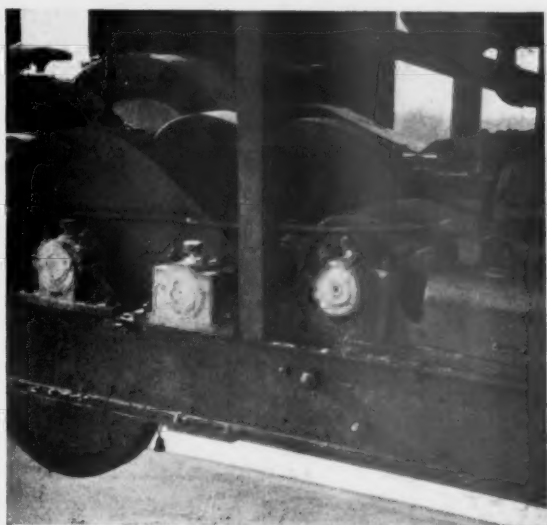


The **MINING** **CONGRESS** **JOURNAL**



**ALSO FEATURED
IN THIS ISSUE**

"Save, Borrow or Pay"
Mining Market Trends
Legislative Review
The Coal Convention
Mechanization Survey
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SAFETY

at
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APRIL

1932

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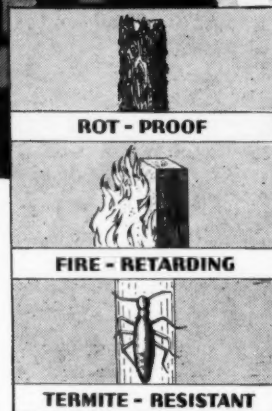
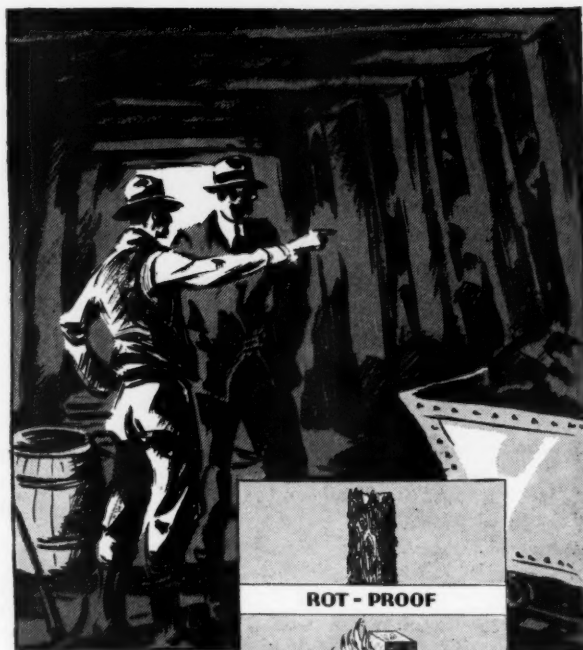
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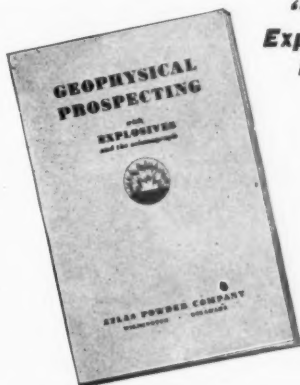
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**ATLAS
EXPLOSIVES**

THE MINING CONGRESS JOURNAL

C O N T E N T S

April
1932

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Published every month by The American Mining Congress, Washington, D. C. Edited under the supervision of James F. Callbreath, Secretary of The American Mining Congress.

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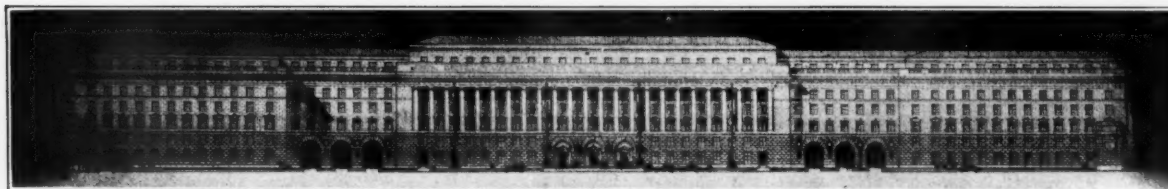
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VOLUME 18, NUMBER 4



U. S. Department of Commerce
Home of the U. S. Bureau of Mines

RIGID TEST

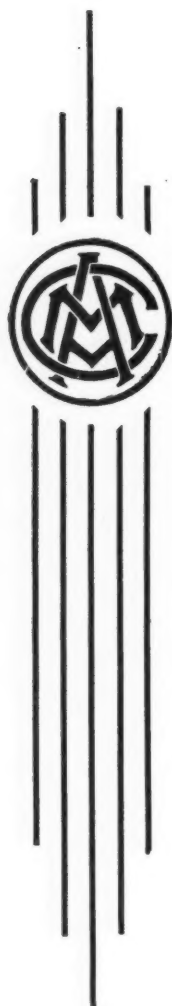


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If you are a Coal Man you know, if you've ever attended one, that these annual **A. M. C.** Conventions represent the best brains in the Coal Industry. Coal Men plan them. Coal Men prepare the programs. Coal Men select the speakers. Coal Men attend them. In a word . . . Coal Men **ARE** the Conventions!

That's why you **NEED THEM** and that's why they **NEED YOU . . .** your experience and your advice, your knowledge . . . your **HELP**. You are one of them. You are of the same hard-pressed, long-marching "business army," all fighting shoulder to shoulder in a common cause . . . if you are a **COAL MAN!**

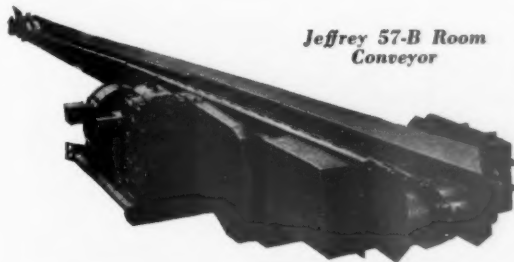
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Gather Coal From Your Room Conveyors



Jeffrey 52-B Belt Conveyor—made for either flat or troughed belt of any width up to and including 36". It is the ideal Entry Conveyor.

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Jeffrey 57-B Room
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Usually placed along the rib, receiving coal from the 49-G which is across the face, and delivering it to the entry conveyor. Single chain type with hold downs. The power unit (motor and speed reducer) is mounted on separate base detachable from the head end when the conveyor is moved to a new setup.



Jeffrey 49-G
Face Conveyor

A light type face conveyor—ruggedly constructed and using a single strand chain. Maximum length to which it may be extended is 42 ft. Designed for room faces—anywhere underground that a short portable conveyor is required.

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For the Room—the Jeffrey 57-B Conveyor—a light and easily extended conveyor for delivering coal to the entry conveyor. (Illustrated and described at the left).

For the Face—the Jeffrey 49-G Conveyor is used on room faces and pillars—also for rib drawing and in cross cuts. (Illustrated and described at the left).

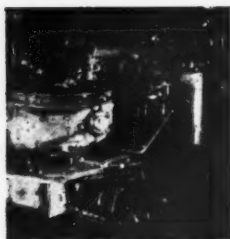
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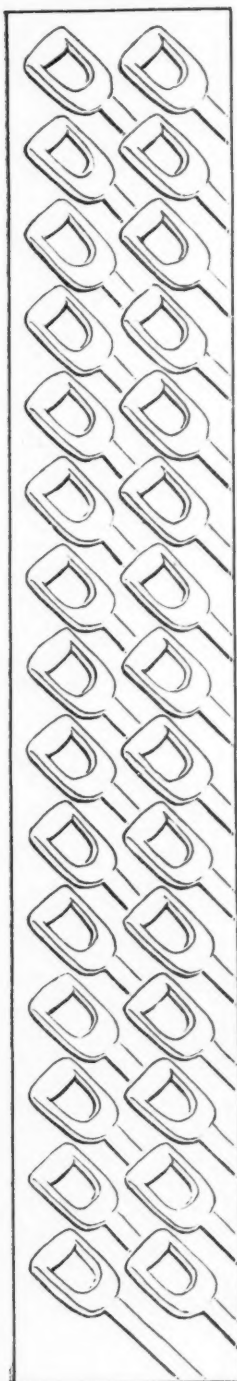
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JEFFREY COAL MINE EQUIPMENT



One pair of hands here

equals —



thirty pairs of hands here

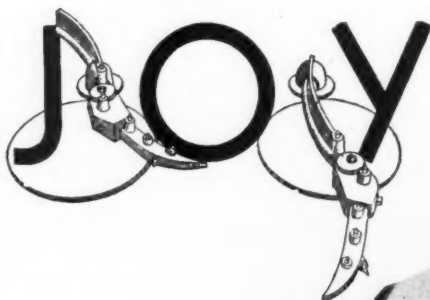
ONE pair of hands at these controls easily loads as much as thirty hand shovelers. That is the average *output* of this standard Joy Loader and its *capacity* is more than three times as great.

This same pair of hands swings the loading boom over a wide arc, slips the machine (on or off track) through close timbered places and shifts it quickly from face to face. That is the *flexibility* of this loader.

Having the control in these same two hands concentrates the working places. Supervision, haulage and safety problems are simplified. *Three more* important points for mechanization.

Loading is steady while there is coal to be loaded. These machines maintain a constant stream of coal at two or more tons per minute. *Here again* Joy Loaders score.

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Because of their wide experience throughout the coal fields of the country, Joy engineers are able to closely estimate the possibilities for cost reduction at your mines. Let them survey your property—at no obligation to you. It will mean real economies for you. Any information you desire will be gladly supplied.

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THE JOY 5-BU



*A Journal for the entire mining industry
published by The American Mining Congress*

Save, Borrow or Pay

IN TIMES OF RADICAL falling price levels no problem is greater than that of balancing the budget. At this time the Federal Government is in the throes of an effort to get around the doctrine of diminishing returns. It is recognized that the expenditures of Government must be paid else the Government fails. Congress is now making a herculean effort to accomplish this end. Nearly every state, if not every state, in the Union is troubled about its expenditures. Most county governments, probably all city governments are having the same problem and are facing the same character of dilemma. Practically every business house in the nation is working upon the same problem.

Save, Borrow or Pay—which shall it be? Payment is difficult. Borrowing is dangerous. Saving is possible but only through a revolution in legislative thought and administration habit. Bureaus grow and through patronage, influence legislative judgment.

There are two ways to balance a budget—one to provide an income sufficient to meet the current expense and the other to reduce the expense to correspond with the probable income. Business houses with executive management can by a painful process immediately reduce expenditures. Governments find it more difficult to accomplish this task. Every effort on the part of the Federal Government to reduce its force is followed by an avalanche of appeals from Congressmen and political leaders for the continuance of this or that man's job. Every effort to reduce activities develops similar opposition.

The wastes as well as the legitimate costs of the World War must be paid. The administration of many activities connected therewith are we suspect costing much more than would be necessary under direct business management charged with the responsibility of making ends meet. But in public affairs every effort to reduce expenditures is met by a political pressure which no bureau chief can resist because it may mean the entire subvergence of the activity which makes for the dignity of his official position.

Facing this situation are the diminishing earnings of everybody as price levels go lower and lower. An income tax bill depending upon taking a share of business profits is without return when those profits cease. The startling increase in governmental expenditures, nation, city, county and state, present a picture calling for heroic treatment. State burdens have be-

come so great as to discourage investment of capital in going enterprises because of the diminishing returns as compared with the cost of state taxation. The effort to curtail Government activities must be undertaken with brutal determination to reduce expenditures substantially and without reference to the suffering which may be created thereby. Congress, state legislatures, city officials must cut expenditures to save the country from bankruptcy. In 1913 all governmental expenditures amounted to about three billions of dollars. In 1923 these expenditures had grown to nine billions, and in 1929 to thirteen billions. The per capita tax has grown in 16 years from \$30.24 to \$107.87. Even this statement does not tell the whole story as the greater part of our people pay no direct tax. To the extent that we enjoy greater service we should be willing to pay but when the time comes, as it now has, that we are unable to pay for these luxuries we must in some way be relieved of the burden.

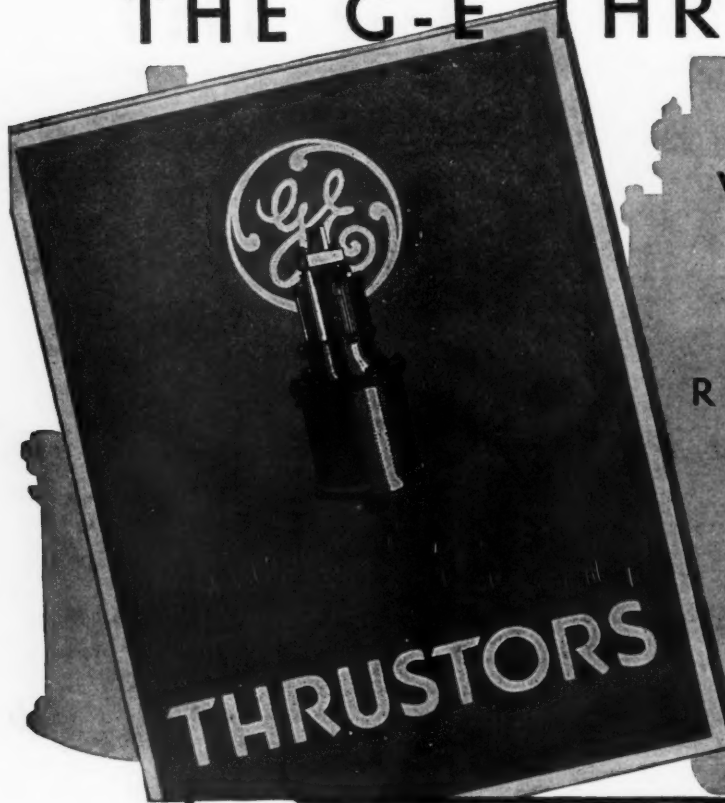
How is this to be accomplished?

The proper way would be to thoroughly survey governmental activities, to separate the necessary from the unnecessary—to separate those of undoubted governmental function from those which could be accomplished by private enterprise or are a part of the proper responsibilities of the several states, to discontinue the improper services and reduce the cost of the proper Federal activities by preventing duplication and waste.

This, because of political pressure, is very difficult. A possible solution might be to blindly order a percentage reduction of all budgets—a 20 percent reduction annually would in four years' time reduce the cost of government to about 40 percent of its present burden which could be easily met. Less Government interference and more responsibility upon the citizen would add to the earning power of the nation. No result is more necessary than that the credit of the Government shall be preserved.

Let us spend less—borrow less—pay our current expenses—and as soon as may be pay our national debt.

THE G-E THRUSTOR



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The MINING CONGRESS JOURNAL

APRIL, 1932
VOLUME 18
NUMBER FOUR

Editorials

War Debts

IT MAY not be within the province of a strictly mining journal to discuss war debt reparations and yet perhaps no branch of industry is more directly affected by the proposal which has been under discussion all these years regarding the cancellation of the war debts. The mining industry pays a very considerable portion of the taxes of the country. If the war debts are to be cancelled the tax payers of this country will be obliged themselves to make up the money to pay our liberty bonds which represent money borrowed by foreign countries.

One of the weighty discussions upon this subject is credited to Calvin Coolidge, who said, "They hired the money, didn't they?"

There are in this country very many debtors who are unable to meet even the interest on the mortgages which cover their homes. If they can not pay the interest and their creditor is unwilling to give an extension of time their property is sold and they are given a certain extension of time in which if they can raise the money they may redeem their property from the sheriff's sale.

Are not the farmers of this country, law-abiding, reputable citizens entitled to as liberal treatment as that to be granted to Germany? We have granted a moratorium in the payments fixed by agreement to enable these countries to tide over business depression and this generous treatment is assumed to be a promise that the whole debt will be cancelled. We have no grievance against the German citizens, but Germany as a nation is not entitled to the consideration she has already received; she is not entitled to the credit which has been extended. The bankers who have extended that credit would not be entitled to sympathy even though the money never was collected. The bankers who have unloaded these bonds upon the citizens of this country have committed a dastardly assault upon the business prosperity of this country in that they have absorbed funds which should now be applied to the building up of our own business prosperity.

One of the Causes

AT A RECENT national association convention a notice was prominent to the effect that the first man who had mentioned the word "depression" in that gathering would be buried the following day, followed by the laconic statement, "We still have the gun."

We believe that the depression psychology is altogether too prevalent, but at the same time we believe that the causes of, the remedies for, and the means of preven-

tion of unusual business conditions should be studied while the facts are most in evidence.

During 1889 a very unusual condition existed in industry. Many of our wise financial leaders realized that current price levels could not be maintained and turned their property into cash as a prudent measure of self-protection. These wise people started an avalanche and many of them during the year 1930 put their cash back into the same securities which they sold the year previous only to find the avalanche which they started was still moving and the profits of '29 were turned into losses in '30 and '31.

Primarily and presently a great handicap to business revival is the inability of banks to provide local business enterprises with their usual funds for the carrying on of their various lines of business. Very few business enterprises carry on entirely with their own capital. Either temporary loans are made from banks to care for purchases until returns can be secured through sales, or bond issues are sold providing permanent capital for that particular enterprise. The local business man is unable to carry on except from temporary loans from banks. When this psychology reaches every corner of the nation, we may well speculate as to the causes of the distrust which ties up the money of the nation. Theoretically we are supposed to have a larger amount of money in this country than ever before. Our supply of gold is larger. Gold is the ultimate measure of value. Why should this distrust wreck the business of the country if the usual amount of money is available? Are we not justified in the assumption that the money, which has usually cared for the ordinary affairs of business, has been improperly diverted to other fields?

Senator Hiram Johnson in a recent address to the United States Senate pointed out that 16 foreign countries had, in the recent past, secured loans in this country to the extent of \$1,600,000,000. Senator Johnson pointed out further that the securities thus purchased have depreciated in value to the extent of \$742,000,000 in the hands of our own citizens. How much have our domestic securities depreciated in value because of the lack of that vast amount of money which would have enabled our own enterprises to do business as usual?

The withdrawal of so large a sum of money for foreign investment may well be a controlling cause in slowing up the stream of commerce at home.

The Davis-Kelly Coal Bill

Senate on Mines and Mining, now conducting hearings on the Davis-Kelly coal bill.

THE dire stress of the bituminous coal industry is finding expression in the testimony presented before the Subcommittee of the Committee of the

Representatives of the United Mine Workers of America have appeared before the sub-committee stressing the constitutionality of the proposed legislation. Great emphasis has been laid upon this phase by the representatives of the workers. The inference is developed that the workers of the mines feel that there is no question in the matter of the need and probable enactment of a Federal coal commission law, but that they feel that it is of paramount importance to carefully and painstakingly construct a broad, sound, constitutional base upon which the legislation may rest in the inevitable litigation to follow such an enactment.

Beginning April 18 before a Sub-Committee of the Mines and Mining Committee of the Senate, will be heard the arguments of the bituminous coal industry against the Davis-Kelly coal bill. This bill contemplates a Federal Coal Commission to function for the coal industry in a manner similar to the relation of the Interstate Commerce Commission in its functioning for the railroads.

In the years past the bituminous coal industry has been nearly unanimous in the position of its management toward Federal control. It has unhesitatingly opposed any effort made toward such an end. The tendency of the national legislative bodies in the present session of Congress is open to interpretation.

The Norris Anti-Injunction and so-called "Yellow Dog Contracts" bill passed the Senate and House with a dispatch startling to the management of the industry.

In the last few days, Justice Brandeis of the Supreme Court dissented in an opinion which ruled against state public utility control of ice manufacture in the State of Oklahoma. Justice Brandeis felt that it is within the rights of legislative bodies to conduct social experiments.

Up to the present time, there have appeared before the sub-committee hearing the testimony on the Davis-Kelly bill, three operators of coal companies who have approved of and asked for Federal coal commission legislation, stating furthermore that they do not deem it within the limit of possibility that those conducting the coal mining industry of the United States, can ever be depended upon to develop the affairs of the industry in an orderly manner.

There are many more operators of mines to be heard from, extending from the State of Washington on East, and it is understood that the majority of these representatives of the bituminous coal industry are definitely opposed to Federal interference. Even with the strong pressure which apparently lies behind the attempted legislation, any enactment at this session of Congress is doubtful, but it will be for the best if the industry will develop a full appreciation and deep interest for what is taking place in the capital city. The Mines and Mining Committee of the Senate and the Interstate and Foreign Commerce Committee of the House of Representatives should be fully advised of the condition of the industry.

What Advantage A Depression?

elimination then becomes imperative. None but a rich company can afford to hold archaic equipment in operation. Drills, cutting machines, cars, locomotives, hoists

and other items of equipment which seemed to serve well enough when business was better may be too inefficient for the job now. Methods which seemed good enough before are subject to revision in line with present selling prices. In this way, improvements are one of the advantages of a depression.

Much new and improved machinery has been designed by the manufacturers who serve the mining industry. The more progressive mining companies are of the belief that this is a good time to modernize—in fact that it is necessary to do so in order to meet present conditions and to be prepared for the future. They are not allowing themselves to be overcome by the gloom that prevails in many places because they know that after every depression we have gone back to a higher rate of production for almost everything and a higher general standard of living than ever existed before. They know that they will be in a much better position to compete in expanding markets as conditions improve than their competitors who do not exercise the same foresight.

This understanding and courage is very much in evidence as the time approaches for the American Mining Congress Ninth Annual Coal Convention and Exposition. The program committee is arranging for the presentation of every phase of the subject, "Economies of Modernization." The manufacturers are planning exhibits of their latest developments and the coal companies have signified their intention of sending operating officials in the same numbers as in past years. Every indication points to the most constructive of these conventions yet held.

A Wonderful Country

securing pardons and reprieves for those who commit other crimes, those who believe that through internationalism lies the only path to prosperity; those who crusade for the establishment of the truth of the bare face lie that Germany was not responsible for the war; those who favor the entire cancellation of the World War debts. The people of the United States should stand firm against such a cancellation. It should close its markets to every country which undertakes to repudiate its debts; it should grant ready passports to people who plot against our Government. It should deport at the earliest moment possible every Communist and every believer in Communism. It should take quick action for the punishment of all crime and it should without delay put beyond the power of further damage all men who go out armed to kill if necessary to prevent arrest for premeditated crimes.

Our Constitution provides for the protection of the law-abiding citizens. Such protection lies only in the quick and speedy punishment for every murderer or would-be-murderer. The people of the United States have many problems of grave importance all of them looking to the creation of that condition laid down in the Constitution of the United States which provides protection to life, property and the pursuit of happiness.

THIS is a wonderful country. It possesses citizens of every shade of opinion—those who are wasting their sympathy upon criminals and se-

SAFETY

at
**M. A. Hanna
Properties***

by
**C. G. Brehm
R. R. Trengrove
and Wm. Roy** } **Safety Committee**

FOURTEEN HUNDRED and ninety days without a lost time accident at the Richmond iron ore mine, 927 days at the Wakefield mine, and 696 days at the Harold mine, is the answer to the question, "Does organized accident prevention work pay?"

These figures were compiled on January 1, 1932, and the report shows four other mines that had had no lost time accidents for from 10 to 16 months. The average number of men employed in these seven mines for the last three years was about 700, with an average of about 540 for 1931. These figures also show that there was a total of six mines without a single lost time accident in 1931. The table below shows the accident experience for the total of 11 ore mines operated by the M. A. Hanna Company for the last seven years:

in many instances in order to work out the stagger system the two-men gangs in our underground properties have been made up of men who have not worked together before. Doing this has increased the hazard greatly until such time as these men got thoroughly familiar with their new working places and their new partners.

Another thing that has added greatly to the hazard is the fact that working only two or three days a week, as we



Employees assembled for their morning safety meeting at Hanna No. 6, Lafferty, Ohio. These morning safety meetings are held at the Hanna mines before the men go to work.

Bituminous Mines of the Hanna Coal Company

OUR HISTORY OF SAFETY work goes back to 1927 when the company, tired of the many difficulties connected with the settlement of compensation claims, decided to put on a safety director. The most important duties of the office, at that time, were to care for all claims after the accident happened, but it was a start. The whole idea had been conceived in the thought of less trouble, but we are all willing to admit now the only way to save money is to prevent accidents.

At the beginning of 1927, our record was so bad, we were working on a penalty, that is, we were penalized by the state 10 percent over the base rate for compensation costs. The strike of 1927 came in April and nothing much was done that year, except care for the cases already existing and, in a small way, impart to our organization the advantages of safety work.

In 1928 the mines were operating on an open shop basis. Many new men were imported—changes were taking place every day. The excitement was intense—the general supposition being that very little could be done. Yet, what was done proved to be of great advantage and proves that any kind of safety work is better than none. Let me say here,

Year	Average No. men employed	Fatal accidents	Number of compensable cases (over 7 days)	Total number of lost time accidents
1925.....	1,484	2	78	171
1926.....	1,718	3	86	212
1927.....	1,553	4	115	218
1928†.....	1,401	2	44	13
1929.....	1,541	6	27	36
1930.....	1,300	4	23	31
1931.....	1,009	0	8	28

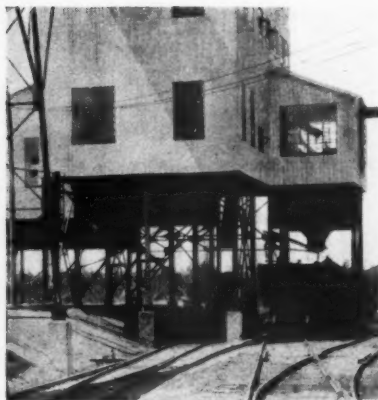
† Safety program reorganized in 1928.

You will note that we had considerably fewer men employed in 1931 than in the previous years, but we regard the accident possibilities as much greater because of the stagger system, forcing us to take men out of places where they were familiar with the working conditions and putting them into new working places where they had to familiarize themselves with strange conditions; and

are in many places, the ground conditions can take on considerably greater weight and increase the hazard of ground falls between Wednesday night and Monday than from Saturday night to Monday morning. Another thing that increases the hazard is that the three or four day layoff during the idle time has a tendency to make men less liable to be "on their toes" for conditions making for an accident than though they are working steadily every day in the week.

Later in this article we will discuss the operation of the safety system in this district.

* Some of the iron ore mines referred to in this article are operated by the M. A. Hanna Co. for the National Steel Corporation and the balance are operated for the mining companies in which the National Steel Corporation is a joint-owner—these partners include the American Rolling Mill Co., Inland Steel Co., Republic Steel Corporation and Wickwire Spencer Steel Co. The anthracite mines are owned by the Susquehanna Collieries Co. and the Lytle Coal Co., and the bituminous mines by the Hanna Coal Co.—these coal companies being subsidiaries of the M. A. Hanna Co.



Showing the good house-keeping around the Mesabi Chief Ore Washing Plant

safety does not come by the miracle worker. There is nothing superstitious about it. It can be summed up in one word, "faithfulness." This, of course, must be the attitude of all men employed in a supervisory way.

We now reach the year of 1929 and what do we find. Instead of working on a 10 percent penalty, we start the year on a merit rate and receive an 11 percent reduction instead of the 10 percent increase on base rate. During all this time, monthly meetings were being held—gradually taking in all the men employed. Some entertainment was provided by the men themselves. Enthusiasm was beginning to grow. Employees were realizing in a small way it was for their benefit.

In 1929 we had a total of 515 accidents with a tonnage of 1,591,297.00 or 1.604 accidents per 1,000 man-days. Safety work was kept up the entire year. Results were beginning to manifest themselves. Each month, we held our meetings. Each month our division superintendent sent letters to all local superintendents. Men were getting used to the work and were compelled to believe the company was acting in their behalf, that it was for their own good. The sincerity of the company throughout this year made all honest men believe we were their friends and with such a spirit we approached the year of 1930.

Based on better performance, in 1930 we received a credit rate of 41 percent less than base rate. However, in July, 1930, the accident rate in all mines in the state was so high the industrial commission was compelled to raise the base rate. We retained the same

amount of credit, although it reduced our percentage for the last half of 1930 and first half of 1931 to 34 percent less than base rate. The year 1930 ended with a total of 246 accidents, with a tonnage mined of 2,037,456.07 and we had an accident rate of 1.10 per 1,000 man-days.

Seeing the increase in rates caused by bad records over the state, the company decided they must do better. Safety work then started with intensified desire and determined action on the part of everyone. Safety organizations were formed. Work started in earnest.

Our safety organization is arranged in three units. The first being the executive unit, which consists of the general manager and vice president of the Hanna Coal Company, assistant general manager, assistant secretary, one man of general supervisory powers, general superintendent, superintendent of each mine, safety director, electrical engineer, and the mining engineer. This committee meets each month, hears all reports and makes such recommendations as they deem advisable.

The second unit is established at each mine and consists of the superintendent,

into book form and each man presented with a copy. Medical examinations are required before starting to work. Emergency hospitals have been established at each mine with a doctor always available. Men are wearing safety shoes and gloves as a condition of employment. Some are wearing safety hats. This work has been kept up the entire year—it is becoming more popular. The men expect it—the company demands it. It can be wiped out in an instant by one word, "unfaithfulness." Any time the local mine management fails to observe the laws required, accidents will increase.

Ending our story with the year of 1931 what do we find? We had a total of 198 accidents with a tonnage mined of 2,137,078.99 tons, our accident rate per 1,000 man-days being reduced to .532. Again the accident experience had been so high in the mines of the state the Industrial Commission had to raise rates, but again we received a little higher percentage reduction. We are now receiving a 31 percent reduction at one company and 48 percent at another, less than the base rate of the state.

Does it pay? Let us see. It can be summed up in a few words:

1927—A penalty over base rate for compensation on account of bad record.
 1929—515 accidents—tonnage 1,591,297.00—rate of 1.604 accidents per 1000 man-days.
 1930—246 accidents—tonnage 2,037,456.07—rate of 1.10 accidents per 1000 man-days.
 1931—198 accidents—tonnage 2,137,078.99—rate of .532 accidents per 1000 man-days.



Hanna Safety Picnic at St. Clairville, Ohio, August 8, 1931, celebrating 57 percent accident reduction during first six months of 1931

mine foreman, section bosses, outside bosses, transportation boss, electrician, clerks and one man from each section or department. This unit investigates all accidents, makes reports to the executive committee. It meets at the mine once each month and has jurisdiction over local safety plans and policies.

The third unit, headed by the safety director, binds the other units in a large meeting each month. At these meetings we have entertainments of different kinds and, at the present time, the women are starting to attend them.

Rules have been drawn up, printed

Anthracite Properties

THE ANTHRACITE PRODUCING region, situated in the northeastern section of Pennsylvania, has an area of approximately 484 square miles.

It is roughly divided geologically and geographically into three separate fields known as the Northern, Lehigh and Southern.

The Northern Field with Wilkes-Barre approximately at the central point, is a basin 60 miles long and almost 6 miles wide at its greatest distance across.

There are in all 11 veins, the upper being approximately 100 ft. below the surface, and the lowest one 1,200 ft., yet, in this Northern Region the measures in some places are 2,500 ft. below the surface and have 19 veins of coal.

The Southern Field is made up of basins of great depth, some being 4,000 ft. deep and its measures are mostly on very steep pitches.

This article deals with the collieries of the Susquehanna Collieries Company and the Lytle Coal Company, which are

owned and operated by the M. A. Hanna Company and of nine collieries in operation, two of them are located in the Northern Field and seven in the Southern.

It is estimated that from the time they were opened up until the present time the gangways driven would be over 3,000 miles, and the breasts or chambers would amount to over 3,600 miles. Our active workings today are such as to require some 350 miles of track to be maintained underground. To handle the output of these mines requires the services of 8,000 mine cars, 700 mules and 113 electric locomotives.

All veins generate an explosive gas, and for the purpose of keeping it diluted and allow the mines to be operated in a safe manner, it is necessary to ventilate them by the use of large fans located on the surface at convenient points. Approximately 50 ventilating fans are used for this purpose.

In the operation of the Susquehanna Collieries Company and the Lytle Coal Company, approximately 10,000 men are employed. Of this number 4,875 are employed as miners and miner's laborers, 2,896 as company men on the inside and 2,339 on the surface and in the breaker operations preparing the product for market.

The subject of the prevention of accidents is, of course, present in all industries, but with added complications in the anthracite field, because of the fact that mining conditions in each of the seams or veins of coal as they prevail throughout the field, differ in the same veins as they appear in the two regions wherein are located the mines of the Susquehanna Collieries Company and the Lytle Coal Company. The Wyoming or Northern is mostly flat workings while in the Southern region mining is in seams pitching up to 75 degrees and over.

The Susquehanna Collieries Company and the Lytle Coal Company have, for many years, been most active in their campaign of accident prevention. Careful inspections of all operations are made, first aid and rescue teams are maintained, and interest is kept alive by safety meetings, meets, publications and otherwise.

On June 1, 1931, in the hope of further efficiency in the Safety Department and further decrease in the number of accidents, the Safety and Compensation Departments were combined.

After a full survey of the company's properties, a meeting of all general in-

side foremen was called, and in several days conference a standard of "Safety Hazards and Guide in Making Safety Inspections" was discussed. This meeting was followed by a similar conference with all general outside foremen. In these meetings all items were passed unanimously before being included in the "standard" thereby giving all foremen a definite part in the building of the guide governing the inspection of the property directly under their supervision. This safety standard is prefaced by the general instructions "These rules are intended to supplement, not to supplant in any manner or form, any of the requirements or provisions of the mining laws of the State of Pennsylvania."

In the meantime, four safety inspectors had been appointed. These inspectors as selected, are men of wide experience in anthracite mining practices and conditions. The property was divided into four inspection districts with an inspector assigned to each district. A meeting was held by the Supervisor of Safety and Compensation and his inspectors, at which time their duties were carefully outlined and the safety hazards discussed in detail. From this meeting the inspectors were sent to the general foremen of their respective districts to again discuss the safety standards so that no misunderstanding could be possible.

With no previous notification the safety



New Town, Hanna No. 1 Mine. The men living in this village had the best safety record in 1931

inspector appears at the mine as the shift is about to start, selects a fire boss or section foreman whom he informs he will accompany on his daily inspection. The fire boss covers his regular district with the safety inspector, who notes any unsafe or sub-standard practices or conditions. A copy of this report is then sent to the Supervisor of Safety and Compensation, the Division Superintendent mine foreman and safety inspector. When the inspector again visits this district he will also note on his report the date his former criticisms were corrected and if not corrected an investigation is



Showing well guarded motors in the Mesabi Chief Ore Washing Plant

made. The Supervisor of Safety and Compensation also visits all collieries and makes joint inspections with the safety inspector and fire boss.

First aid teams are maintained at each colliery, and all first aid training is by a corps of company surgeons. The U. S. Bureau of Mines Manual of First Aid Instruction is used as a text and from this text a series of 12 lessons have been made up and approved by the chief surgeon. By this method all surgeons teaching first aid, are using a standard text and the schedule is such that all first-aid

classes are being taught like subjects at the same time.

In addition to first aid teams, emergency hospitals are maintained on the surface and on each level underground, at each colliery, wherein any injured employe may receive prompt and effective attention, there being 38 underground hospitals at all collieries.

Regular teams certified in mine rescue training are maintained at each colliery, and others are at all times in training under the direction of the supervisor of safety.

A summary of rescue equipment ready for instant use, and inspected at least once a month, is as follows:

- 22 McCaa apparatus—two-hour type.
- 61 Gas masks.
- 5 H. H. inhalators.
- 15 C. O. detectors.

At the close of each month a statement, with blueprints of location, of all serious and fatal accidents is prepared and sent to all division superintendents and safety inspectors. These are carefully examined and discussed at the division safety meetings.

This system has been received by the management and operating officials most

enthusiastically, and complete harmony and co-ordination exists between the Safety and Operating Departments.

Inasmuch as this system has been in effect but five months, definite conclusions are difficult to make at this time, but comparisons of this last five months period, as compared with the first six months of the year show a very substantial improvement both in fatal and lost time accidents. The entire anthracite organization is 100 percent behind the safety movement and the results obtained have been very gratifying to the company.

Accident Prevention Methods in the Lake Superior District

THE SAFETY PROGRAM started in 1913. Most of the safety work consisted of guarding machinery, making monthly inspections of all properties and correcting unsafe conditions and practices when noticed by the safety engineer, foremen and superintendents.

The guarding of machinery is usually the first step in any well organized safety program as it is concrete evidence that the management is back of the accident prevention work and is willing to spend a large amount of money in protecting their employees.

In spite of the guarded machinery and ample supervision, the severity rate and frequency rate of accidents were very discouraging. Late in the year 1927 an educational program was deemed necessary. Regular monthly meetings of all superintendents, mining captains, shift bosses mechanics, electricians and other foremen were started in November, 1927.

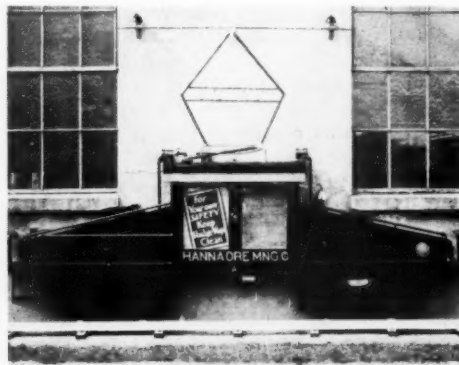
The reports of the lost-time accidents are read and discussed, also the reports of the no-lost-time accidents, near accidents, safety rules, safety suggestions, wearing apparel, unsafe practices, accidents at other companies' mines, and new safety devices. Outside speakers are secured. Salesmen from the various companies handling safety supplies, display and talk on their products. We have talks by oxy-acetylene experts and powder experts and a moving picture display of safety pictures and other educational films.

A committee of three, one acting as chairman, is appointed to conduct the

monthly meetings and holds this office for three months when a new committee is appointed.

In the discussion which follows the reading of each accident, the responsibility of the accident is not always placed but a study is made to prevent recurrence.

Discipline is left entirely to the dis-



Shelter for the Safety Bulletin Board at the Wabigon Ore Mine

cretion of the superintendent and management.

Five of our mines entered the National Safety Competition in January, 1928, and we feel that these entries stimulated the interest in accident prevention work at these mines. The M. A. Hanna Company's properties receiving national recognition by being awarded trophies and certificates of honor are as follows:



Entrance to Hanna No. 9 Mine at Fairpoint, Ohio. On this bulletin board men are welcome, at all times, to make public any suggestions or complaints.

Year 1928:

The Wakefield Iron Company won the Sentinels of Safety trophy in the quarry and open pit group and was the first mining company to bring this trophy into the Lake Superior District. They

had a record of working 283,680 man-hours without a lost-time accident.

The Rogers mine won second place in the underground metal mining group in the Sentinels of Safety contest.

Year 1929:

The Wakefield Iron Company won second place in the national safety competition for the Sentinels of Safety trophy in the quarry and open pit group and the Richmond mine received honorable mention.

The Homer mine won second place in the underground group in the same contest.

The Joseph A. Holmes Safety Association awarded certificates to the following mines:

To the Richmond mine for working 35 men for 130,717 man-hours during the years 1928 and 1929 without a lost-time accident.

To the Harold mine with an average of 123 men, working 471,282 man-hours from May 26, 1928, to January 1, 1930, with but one lost-time accident, this one causing 47 days lost time.

Year 1930:

The Joseph A. Holmes Safety Association awarded certificates to the following mines:

To the Wakefield Iron Company for having worked the combined underground and open pit operation for over a year without a lost-time accident.

To the Wakefield Iron Company again went the honor of second place in the national safety competition for the Sentinels of Safety trophy.

The Richmond mine received honorable mention in this national contest.

We believed that much could be accomplished by fostering among the men a group spirit of responsibility for safety, and by encouraging friendly competition between individuals, and between groups for the reduction of accidents. Therefore, in April, 1928, we started the monthly honor roll.

Every employee of the mines listed on the honor roll received a cigar in a "M. A. Hanna Co. Safety First" wrapper. These are

usually given out at the safety meetings.

The first time that the employees were rewarded for their cooperation in the safety work was in November, 1928, when eight- (Continued on page 31)



ECONOMIC LEGISLATION *in Congress*

CONGRESS has given exclusive right of way to economic legislation. No partisanship has been displayed, members of all parties cooperating with the President in drafting and speedily passing measures to restore equilibrium to the economic structure. Of chief importance was the Reconstruction Finance Corporation which was authorized to make loans of two billion dollars to railroads, financial institutions, commerce and industry.

New taxes are in early prospect, the House Committee on Ways and Means reporting and the House considering the bill following extensive hearings at which protests were made against a tax on the consumption of electric power, gas and oil. The American Mining Congress was represented in the opposition to the power tax on the ground that it would bear heavily on the already depressed mining industry. Following the tax legislation it is expected Congress will consider other general legislation, including the transfer of public lands to the States, which was advocated before the House Public Lands Committee by Governor Dern, of Utah. Relief for silver has continued to keep to the fore in committee consideration and also on the floors of the House and Senate. The special group of western Representatives in Congress who are especially interested in rehabilitating silver heard numerous mining groups in favor of constructive legislation, including the American Mining Congress, A. B. Young, consulting engineer, of Salt Lake City, and F. H. Brownell, of the American Smelting and Refining Co., who has given much study to the question, and the Senate Finance Committee heard advocates of the free coinage of silver. Mr. Brownell said an international conference seems necessary to stabilize the money systems and he advocated the

preparation by Congress of a program for such a conference which should include silver as an aid to gold in the monetary base.

Silver Inquiry

AFTER THESE preliminary inquiries, the House authorized a formal investigation of the silver question by its Committee on Coinage, Weights and Measures, which is being carried on by a subcommittee consisting of Representatives Somers (Dem., N. Y.), chairman; Kemp (Dem., La.), Fiesinger (Dem., Ohio), Thurston (Rep., Iowa), Amlie (Rep., Wis.), and Perkins (Rep., N. J.). This investigation will cover the cause and effect of the depressed value of silver, the monetary policies of the United States and foreign countries and their relation to its value, methods of stabilizing its value, and the advisability of an international conference to consider methods by which by international cooperation the value of silver can be stabilized. The committee is hearing numerous witnesses and hopes to submit legislation before the end of the session. Additional silver bills include measures by Senator Pittman (Dem., Nev.), authorizing the purchase by the government of American produced silver at the market price, the coinage of such silver into dollars and subsidiary coins and the issuance of silver certificates in denominations of \$1, \$5, and \$10 to enlarge the currency base; by Representative Glover (Dem., Ark.), to coin two billion dollars in silver; and by Senator Fletcher (Dem., Fla.), for the government acceptance of silver bullion 950 fine at 50 cents per troy ounce in payment of foreign debts. Under legislation passed by Congress an additional \$750,000,000 of surplus gold over the 40 percent reserve requirement in federal reserve banks is available for trade and commerce.

Mining legislation has covered a wide range. Senators Thomas (Dem., Okla.), and Wagner (Dem., N. Y.), proposed to carry out a recommendation of the Federal Employment Stabilization Board for a six-year program of federal construction, including mining experiment stations at Salt Lake City, Utah, and College Park, Md., and improvements to other experiment and mine rescue stations. An experiment station at New Brunswick, N. J., was proposed by Representative Sutphin (Dem., N. J.). Representative Evans (Dem., Mont.), and Senator Nye (Rep., N. D.), introduced legislation authorizing permittees and lessees under the mineral leasing laws to use an additional 320 acres of land for refining works, mill, tipple, camp site, and other purposes connected with the development and use of the deposits. They also presented measures to permit the patenting under the general mining laws of public lands containing valuable deposits of minerals which are now withdrawn under the reclamation act. Other mining bills introduced include measures by Representative Colton (Rep., Utah), authorizing prospecting permits and leases to asphalt, gilsonite, elaterite and other like substances on the public domain; Senator Cutting (Rep., N. M.), to promote the production of sulphur on public lands in New Mexico, which was passed by the Senate; Representative Carter (Rep., Wyo.), for a two-year extension of oil and gas prospecting permits; Representative Vinson (Dem., Ga.), for supervision of the naval petroleum and oil shale reserves by the Navy; Representative Swing (Rep., Calif.), withholding until March 4, 1935, approval of adjustment of the Southern and Central Pacific Railroad land grants; Senator Bratton (Dem., N. M.), allowing persons who filed on railroad land grants under the pre-emption or home-

stead laws to select other non-mineral lands, but providing that mineral shall not include iron and coal where the lands given up were granted by act of Congress which authorized the grantee to take iron and coal lands; Representative Sumners (Dem., Tex.), authorizing two or more states to make agreements concerning exercise of their powers with reference to the development and preservation of their natural resources; Senator Carey (Rep., Wyo.), authorizing Wyoming to grant 20-year mineral leases to its school land grants; Representative Colton and Senator Costigan (Dem., Colo.), to pay \$161,400 to the Ute Indians for the surface rights in 64,560 acres of their land in western Colorado when the government in 1916 set the land aside as a naval oil reserve; Senator Thomas and Representative Cartwright (Dems., Okla.), for the government purchase at \$10,227,537 of the land and its minerals belonging to the Choctaw and Chickasaw Indians in Oklahoma; Senator Frazier (Rep., N.D.), and Representative Howard (Dem., Nebr.), for 15-year leases to the coal and asphalt deposits of the Choctaw and Chickasaw Indians, a minimum of 15,000 tons of coal to be mined annually, \$500 of the annual minimum tonnage royalty to be paid annually in advance, the royalty being at the rate of not less than 8 cents per ton as mined, the bill being passed by the Senate and reported by the House Indian Committee. Representative Taylor (Dem., Colo.), repealing the stock raising homestead law in its application to lands in Colorado; Senator Shortridge (Rep., Calif.), to pay \$268,500 to the Mack Copper Co., for use of its property in San Diego County, Calif., for military purposes from 1917 to 1922. Congress passed and the President approved a bill authorizing patents to lands in New Mexico which have been held under color of title for more than 20 years. A bill was passed by the House authorizing an exchange of potassium-bearing lands in Tooele County, Utah, between the government and private owners. The House passed a measure granting 200 acres of land in that State for the benefit of the Colorado School of Mines. A bill was passed by the Senate authorizing 20-year mineral leases on lands granted to the Dakotas, Montana and Washington when they became States. The House Claims Committee reported a bill refunding \$16,600 to the Great Western Coal Mines Co., in connection with a coal land entry later relinquished to the government.

Investigations Proposed

AN INVESTIGATION of conditions in the coal fields of Harlan and Bell Counties, Ky., is proposed by Representative Black (Dem., N. Y.), and Senators Cutting (Rep., N. M.), and Costigan (Dem., Colo.). The Senate Mines and Mining Committee held hearings on proposed regulation of the coal industry. The House authorized its Committee on Interstate Commerce to investigate holding companies among oil and gas pipeline, utility and railroad companies. The Judiciary Committee of the House will seek authority to conduct an investigation of the anti-trust laws and their administration in connection with requests for their modification in behalf of the natural resource industries. Senator Steiwer (Rep., Ore.), introduced a resolution for an investigation by a Congressional committee for amendment of the anti-trust laws and pending action by Congress on proposed changes to exempt mineral and forest product pro-

ducers from their present restrictions. A bill was presented by Senator Walsh (Dem., Mass.) authorizing the Federal Trade Commission to give advance approval to cooperative contracts for curtailment of production and other acts to avoid ruinous competition in industries, while Representative McGugin (Rep., Kans.) introduced a bill forbidding executive or judicial departments of the Government from passing upon the reasonableness of any combination in restraint of trade, and Representative McKeown (Dem., Okla.) submitted a bill requiring plaintiffs at law to file affidavit that they have not violated the anti-trust laws.

In drafting the new tax bill Congress is faced with the necessity of raising \$1,241,000,000 additional revenues in order to balance the budget for the fiscal year 1933. In the case of income tax rate changes, if made, they will apply on 1932 income to be returned on tax schedules filed in 1933. New general tax proposals advanced included suggestions by Representative Davenport (Rep., N. Y.) for a commission of 21 persons to be named by the President to coordinate Federal and State taxation and by Senator Thomas and Representative Swank (Dems., Okla.) permitting the States to tax property employed and business done in interstate commerce.

Mineral Tariffs

AGITATION FOR revision of the tariff continues. Legislation proposing a duty of 5 cents per pound on imported copper was introduced by Representative Douglas (Dem., Ariz.), in which he points out that foreign imports are injurious to the copper producing industry in 20 States, more especially Arizona, Utah, Nevada, Montana, Michigan, New Mexico and Tennessee. Similar bills were introduced by Representatives James (Rep., Mich.), and Evans (Dem., Mont.). An import duty of \$3 per long ton on anthracite coal was proposed by Representative Brumm (Rep., Pa.). A bill for a \$3 per ton duty on all coal was proposed by Delegate Wickersham (Rep., Alaska); of \$1 per ton on bituminous by Representative Smith (Dem., W. Va.); and of 15 cents per 100 pounds on all coal by the following Pennsylvania Representatives: Brumm, Turpin, Coyle and Magrady (Reps.) and Boland (Dem.). Duties on oil were suggested by Senator Capper (Rep., Kans.), and Representatives Sanders (Dem., Tex.), Disney (Dem., Okla.), and Ayres (Dem., Kans.).

What's Doing In Congress

ECONOMIC RECONSTRUCTION Legislation Given Right of Way.

TAX INCREASE Bill Before House.

HOUSE Committee Investigates Value of Silver.

NEW Mining Experiment Stations Recommended.

ADDITIONAL LAND AREA Under Mineral Leases Proposed for Refining Works.

INVESTIGATION REQUESTED Into Kentucky Coal Mining Area.

IMPORT DUTIES AND TAXES Suggested on Anthracite, Copper and Oil.

INVESTIGATION As to Relaxation of Anti-Trust Laws By House Committee.

RETURN OF PUBLIC LANDS and Their Resources to the States Advocated.

MUSCLE SHOALS As Aid to Southern Coal Industry Developed At Hearing.

SENATE DEFEATS Federal Relief for the Unemployed.

ANTI-INJUNCTION BILL Passed By Congress.

MARKET

TRENDS

Lead-Zinc

MARCH WAS AN uneventful month in lead-zinc. Lead held at 2.50 cents to 3 cents and was "steady" to "dull." Total stocks increased over the corresponding period last year; and the American Smelting and Refining Company shut down their smelter at Murray, Utah, for 30 days, while the International Smelting Company operates one furnace at Tooele 20 days a month for lead, and runs the oxide mill 12 days a month. Even the 3-cent price, the lowest since 1897, failed to stimulate the market.

Battery dealers urged breaking up of cases before selling old batteries for remelt, because of the growing custom of rebuilding worn-out and defective batteries and flooding the market with cheap and unserviceable stock.

Zinc at 2.80 cents to 2.82½ cents dragged through the month, with a new all-time low of 2.75 cents on March 2, but no business. The middle of the month, production and shipments were about balanced.

Smelters refused to sell zinc for future delivery except at a premium, and the market became deadlocked the last of the month, because no ore was forthcoming at the prices offered.

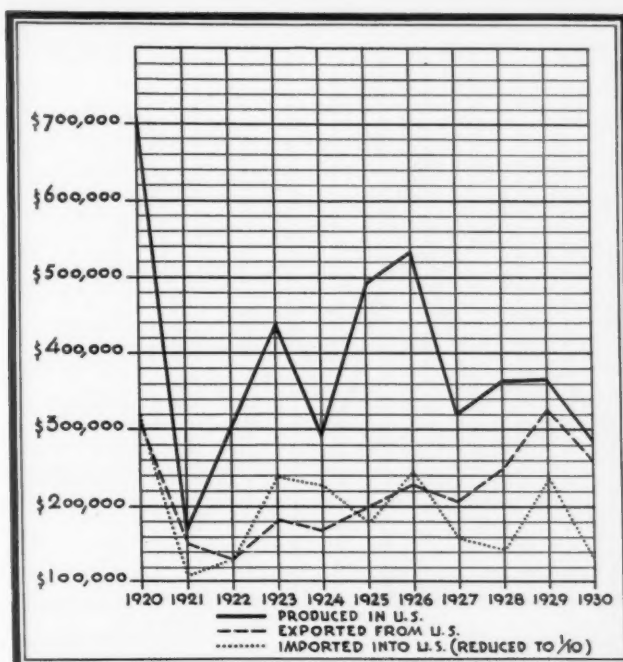
Antimony

BONDED STOCKS in New York increased 80 tons during January. On February 2 the price spurted to 7 cents, after which it has been inactive for several weeks. Stocks are reported piling up in China from lack of buying in the United States, and political conditions in China which hinder shipping.

Silver

THE GENERAL MARKET is optimistic. October deliveries are quoted at 32.60 cents, and December at 33 cents. The hearings before the Committee on Coinage, Weights and Measures for silver stabilization continue, with evident sincere purpose to solve the problem.

Mica
1920-30



The Rt. Hon. Winston Churchill wrote the committee urging an international conference. Mr. F. H. Brownell testified that if the price of silver had been stable, Great Britain and the United States "would have been falling over each other" to build the 100,000 miles of needed railroads in China. Sir Robert Horne, of London, said that the United States and the British Empire, acting together, could establish a bi-metallic standard and thereby contribute powerfully to the world's recovery.

As we go to press, announcement is made that Mexico has contracted for 23,000,000 ounces of silver, to be used for subsidiary coinage over a year's period.

Iron Ore—Manganese

IRON ORE and manganese concentrates imported into the United States in 1931, declined both in tonnage and average value. Manganese fell off 11.7 percent by weight and 21.2 percent by value. Cuban manganese imported in 1931 was about 200 tons greater than in 1930. No manganese was exported from the United States last year.

The smallest production of ferro-manganese in many months was recorded in February, due to heavy production and accumulated stocks during the past two years.

Potash

THE \$1,000,000 potash plant at Loving, N. Mex., will be in operation in September, for the marketing of refined potash. The company is mining and crushing 2,000 tons of raw potash ore per month, in preparation for refining.

Sulphur

A NEW PLANT at Midland, Tex., and a larger one under construction at Texon, Reagan County, utilize natural gas as a source of sulphur for commercial fertilizer, the purified gas being then sold for domestic fuel.

Gold

SURPRISING QUANTITIES of hoarded gold released from India, have equalled or exceeded the production of the Transvaal in 1931, and amounted to 52.3 percent of world production. This has proved equivalent to a new strike. Forty-one million pounds sterling were shipped from India to Great Britain, due to the rupee premium on gold.

Official London has been resisting the rise in gold. The people of Great Britain have sold for reduction to bullion £3,576,000 in gold sovereigns and £1,800,000 in jewelry. It is anticipated that £230,000,000 will yet come from India, whose people prefer silver for jewelry and coinage, and have never lost the habit of silver hoarding.

Nickel

THE INTERNATIONAL NICKEL Company announced a net profit in excess of \$5,000,000 for 1931, stating that consumption of nickel in the United States had increased 160 percent in 10 years. Many new uses have been developed, among them nickel anodes used in nickel—and chromium-on-nickel-plating, and the introduction of nickel-copper condenser tubes.

Tin

TIN FELL OFF late in February, advancing 10 points March 1, dropping 20 points immediately thereafter, and steadying at 22.35 cents, which was 160 points over January 5. Heavy selling in London caused a slight advance in New York the middle of the month, but buying was from hand to mouth, until Sterling improved, when it fluctuated around 22 cents.

The last week in March 195 tons were shipped from Liverpool to New York, the first Westward shipment since October 12th.

Aluminum

STEADY DEMAND continues in Cleveland for second-hand aluminum for re-melt purposes. A considerable market has been found for aluminum as ornamental bridge material. Retarded automobile production has caused a corresponding slow down in bauxite mining and aluminum production.

It is reported that Japan intends to form an aluminum company with a capacity of 12,000 tons per year. The government will grant a subsidy of 55,000 Yen per year for five years. Japan's imports of aluminum have been: 1929, 12,000 tons; 1930, 11,400 tons; 1931, 5,000 tons.

Coal

THREE HUNDRED THOUSAND TONS of Chinese coal are contracted for North Atlantic ports, principally Boston. The first cargo, arriving this month, was from French Indo-China to the North American Coal Corporation.

German and English coke selling at \$1 to \$2 less per ton than domestic coke in New England, have also cut into the Connellsville coke business. Connellsville coke is laid down in Boston at \$7.19 per net ton; local by-product coke sells for \$7.75; while German and English coke are offered at \$5 to \$6.50.

These and other representations, led to the introduction of a bill by Representative Turpin, of Pennsylvania, for a duty of 15 cents per cwt. on all coal and coke imports.

A proposition is also before the Ways and Means Committee for a 1-cent-a-gallon tariff on imported oil.

It was reported March 4 that industrial coal stocks were the lowest since August, 1931.

Due to strikes in Ohio, production of slack fell off and the Lakes markets stiffened. Nut and slack fell off 10 cents in Boston, however, due to mild weather the first part of the month.

When the old snap struck the Middle West and the East, telegraph orders came in from Indiana, Central Ohio, and Southern Michigan for bituminous coal and domestic coke. To meet competition in Indiana and central territory, Ash-

land, Ky., by-product coke dropped 50 cents a ton.

Production in the Pittsburgh District jumped 75 percent for the domestic market, although industrial and railroad demands held even, and steam slack fell to 50 cents.

The Hocking Valley strike has thrown sufficient tonnage to neighboring fields to increase their output 25 percent. Southern Illinois and the Pocahontas field worked more days per week than any time this winter, to supply the Chicago domestic market. "No-bill coal" disappeared.

N. Y., N. H. & H. R. R. fuel bids from reciprocity contract shippers, developed a spread of 99 cents between maximum and minimum.

Final organization of Appalachian Coals, Inc., embracing over 70 percent of the high volatile coal tonnage of Kentucky, Tennessee, West Virginia, and southwestern Virginia, with an output of over 42,000,000 tons, has been completed in preparation for the test suit of the Department of Justice, on the Regional Sales Agency Plan.

A similar organization, Northern Coals, Inc., representing 80 percent of the Ohio and West Virginia Panhandle tonnage, has also been created.

Operators in general are opposed to the Kelly-Davis Plan now before Congress. The United Mine Workers are for the bill. The Illinois operators refused to sign the miners' wage scale for a five-hour day and a six-day week, with basic pay unchanged. The operators claim that all costs except labor, have been cut to the bone. Illinois tonnage is now below that of 1907.

Prof. Nold, of Ohio State University, finds that from 1923-28 Ohio labor costs were so much higher than in competing territory, that Ohio production declined approximately 25,000,000 tons. After readjustment of wage scales on a competitive basis in late 1928, Ohio coal again entered into competition, with a resulting gain of 6,000,000 tons in 1928-31.

Kentucky has passed a new law limiting trucks to 4 tons capacity, 30-ft. length including trailer, 8 ft. width, and 11½ ft. height, in an effort to break up snow-bird coal mine deliveries, and unfair competition with the coal-carrying railroads.

Continued strikes and threats of strikes April 1, together with depleted stocks due to cold weather, stiffened the market 15 cents to 30 cents a ton as industrials built up their supplies.

Anthracite shipments for February were three and one-third million tons, an increase of 289,000 tons over January, but 1,053,000 tons less than in February, 1931. Strikes in the anthracite field have led to many surmises regarding prices after April 1.

New discoveries of coal in the Argen-

tine costing \$8 per ton vs. \$24 for Welsh coal, are disorganizing that market. The local coal is pulverized and meets with favor.

The railroads benefited greatly by the cold weather, some of the coal-carrying lines having an increase as great as 25 percent in tonnage.

Copper

ALTHOUGH NEW all-time low levels of 5.75 cents were reached, copper movements were light. Reports early in the month, that Copper Exporters, Inc., would break up caused further decline. After two weeks of conference with the Belgian representatives, who three months ago objected to further curtailment, it was announced that a 17½ percent production rate in connection with the companies outside the agreement, would bring about an output slightly below world consumption. Many producers however, will find it uneconomic to operate at this rate, and will shut down.

It is estimated that 2,250,000,000 lbs. of copper to blister stage and beyond, are above ground; more than one year's supply. Producers say that because Canada wants gold is no reason gold-copper ore producers should benefit by the sacrifices of the balance of the world.

While governmental consent must be secured by some of the producers, entailing slight delay in putting the agreement into effect, the assurance of its ultimate operation brought domestic quotations for June to 6½ cents.

The Japanese Copper Association announced reduction to 6,000 tons per month and stated that shipments to Soviet Russia had been discontinued since October, due to too greatly delayed payments and strained credit.

As he sailed for Europe, Sir Auckland Geddes, chairman of Rhokana, stated that in his judgment nothing but increased consumption through new uses, could save the copper industry, due to its greatly over-developed capacity.

No authentic copper statistics have been furnished since September, 1931. Current estimates place world output in February at 70,000 tons; and world consumption at 70,000 to 80,000 tons.

The Copper and Brass Research Association announced discovery of a method of producing a patina or age-green coloration in a few days, through development of a basic copper sulphate.

The Governors of the copper-producing states petitioned President Hoover for a tariff on copper. It was stated that the American miner receives \$5 per day while the African miner receives \$6 to \$7 per month. Other non-ferrous metals, such as aluminum, zinc, antimony and lead are protected. The Ways and Means Committee announced their approval of a 4-cent duty on copper, but the following day rescinded their action.

Mechanization and Unemployment

by
G. B. Southward

IN 1923 there were 8,000 bituminous coal mines operating and they employed 700,000 men. In 1930 there were only 6,000 mines with 500,000 men. By that time we were deriving a sort of left-handed encouragement from saying that things were so bad they could not get worse. But we were wrong—they have gotten worse. Figures for 1931 are not yet available, but it is probable that the number of mines operating today has been decreased to not many more than 5,000 with perhaps 450,000 men employed. Neither the mines nor the men are working full time.

STARTING about the year 1923, various types of machines for loading appeared—mechanical loaders, scrapers, conveyors and pit car loaders. These proved to be practical and a large number of installations have been made since then but along with the development of mechanized loading (usually termed “mechanization” for short) there has been a decline in the number of mines operating and the number of men employed. This unfortunate coincidence has caused the statement, or rather accusation, to be made that mechanization is responsible for the unemployment which exists today.

The use of machines for loading does save labor and does reduce the territory required for mining by increasing the tonnage produced per working place. But to say that this is entirely, or even largely, responsible for the unemployment and the closing down of 2,000 mines is foolish. The actual cause of the trouble is that the production of coal in 1931 had declined almost 200,000,000 tons per year under the production of 1923. This tonnage reduction is equal to the output of 2,000 mines of 500 tons per day capacity, taking an average working time of 200 days per year. It also represents the loss of work for 200,000 men, figuring 5 tons per man per day. Machines used in coal mining have certainly not caused a reduction in the quantity of coal used by the consumers and the elimination of mechanization is not the remedy for correcting the present conditions.

IN DISCUSSING this subject we should keep in mind that “mechanization” is not confined to loading—it has been applied to nearly all underground operations. Furthermore we should real-

ize that machines in coal mining are not the evil which a number of their critics have accused them of being. Machines of course save labor—that is the purpose for which they are designed. They eliminate the drudgery of coal mining, but they do more than that because they actually make coal mining possible. Just consider for a moment how many different kinds of work are required to mine coal and how essential machines are for the most important of these operations—hoisting, haulage, drainage, ventilation, cutting. In this list we must also include blasting because, although not a machine in the sense of having wheels, explosives save as much hand-labor as any other single device which is used underground.

Like a good many other ideas which have been advanced to cure the present distress from unemployment, the suggestion to discontinue mechanization may be theoretically possible, but practically it is impossible. For instance, we can not imagine how a mine could be ventilated or pumped without machines. Neither could coal be hauled or hoisted by hand. Explosives can not be eliminated. Cutting might perhaps be done with pick work—at least it used to be done—but we should scarcely consider it feasible today. Mechanized loading could be discontinued but since only 10 percent of the present output is loaded with machines, the effect of their elimination would scarcely be noticed.

THIS point is brought out by the figures in the following paragraph which are calculated from statistics compiled by the U. S. Bureau of Mines. Mechanized loading started in 1923 and a comparison between the tonnage loaded per man-day in that year and 1930 (the latest figures available) shows the very small effect that machines have had on the production rate for the country as a whole. This average rate does not, of course, apply to the individual mines where loading machines are used. The figures also show a much greater increase in the production per man-day in the other operations of mining than has been made in the loading. These cal-

culations apply only to the underground work and do not include surface operations or coal stripping.

The average tonnage per man-day employed for all underground work was:

1923	5.2 tons per man-day
1930	5.6 tons per man-day

The tonnage per man-day employed for loading and shot firing was:

1923	7.3 tons per man-day
1930	7.6 tons per man-day

The tonnage per man-day employed for the other underground operations, excluding loading and shot firing was:

1923	17.4 tons per man-day
1930	21.2 tons per man-day

From the above we have the following increases in the tonnage production per man between the years 1923 to 1930:

All underground work....	8% increase
Loading and shooting....	4% increase
Other operations	22% increase

THESE figures show a conclusion so obvious that they do not require much comment. They show that machines have not deserved the criticisms which have been directed against them. In seven years the total average production rate of all men underground has only increased 8 percent—certainly this is not the main cause for unemployment and any nation-wide movement to discourage machine work would not be the remedy. Even if the elimination of machines could bring about the employment of more men or more man-hours, it would not be of any help. There is a certain amount of coal used and purchased for which a certain sum of money is received. To decrease the production per man would create more work but it would not cause more money to be paid. The total amount of wages would still be the same and there is no particular advantage in working a longer time unless the pay is to be increased proportionately.

A better plan which is being followed by a number of companies is to continue their machine operations, divide the time among the men and pay as high a rate as possible for fewer working hours. This gives the men an opportunity to have small farms or gardens during their off days and so far is the best solution which has been found.



GEORGE C. McFADDEN
Chairman,
Program
Committee

The COAL CONVENTION

PRACTICAL COAL operating officials and equipment men will soon be on their way to Cincinnati, Ohio, to attend the ninth annual coal convention and exposition to be held from May 2 to 7 by the American Mining Congress. Preliminary estimates are that the convention and exposition this year will compare favorably in all respects with those of former years. Reports to the headquarters of the American Mining Congress, whose officials are cooperating with the program committee in preparing the details for the gathering, are to the effect that a large number of companies will have exhibits of the latest types of machinery, equipment and supplies and that there will be an attendance of several thousand representatives of coal companies and machinery manufacturers.

George C. McFadden, assistant vice president of the Peabody Coal Co., of Chicago, as chairman of the program committee for the convention, has had the cooperation of leading operators in all parts of the country in the preparation of the program for the sessions which will be devoted to consideration of practical operating problems in both the anthracite and bituminous industries. Heretofore there has been one session devoted to the anthracite industry, but this year the practical operating problems of this industry as well as those of the

bituminous will be discussed at all sessions at the convention. Operators who have served on the program committee include the following:

Program Committee

PENNSYLVANIA, northern West Virginia, and Ohio districts—M. D. Cooper, district chairman; P. C. Thomas, L. E. Young, R. M. Shepherd, A. J. Musser, E. J. Judy, Newell G. Alford, J. J. Geary, J. Wm. Wetter, E. J. Newbaker, George J. Krebs, D. L. Brown, G. Webb Shillingford, Thomas G. Fear, Wm. Emery, Jr., Ezra Van Horn. W. C. State, A. D. Carlton, F. W. Braggins, W. L. Robison, and Wm. P. Cayton.

Illinois and Indiana District—H. H. Taylor, Jr., district chairman; J. D. Zook, F. S. Pfahler, Charles F. Hamilton, A. C. Callen, Paul Weir, George F. Campbell, Carl T. Hayden, T. C. Mullins, Charles Gottschalk, T. J. Thomas, H. A. Treadwell, Wellington O'Connor, W. F. Davis, W. J. Jenkins, Carl J. Fletcher, David Ingle, and C. G. Hall.

Southern West Virginia District—L. N. Thomas, district chairman; H. S. Gay, Jr., H. D. Smith, P. C. Graney, H. B. Husband, Edward Graff, L. T. Putnam, and J. S. McKeever.

Virginia, Kentucky, and Tennessee District—G. E. Smith, district chairman;

L. C. Skeen, Harry LaViers, Lee Long, C. A. Griffith, J. D. Rogers, C. F. Richardson, and W. A. Ellison.

Southern District—J. A. Long, district chairman; D. A. Thomas and C. E. Abbott.

West Central District—K. A. Spencer, district chairman; V. C. Robbins, Ira Clemens, and L. Russell Kelce.

Far West District—Otto Herres, district chairman; Samuel Tescher, G. C. Davis, F. W. Whiteside, E. P. Lucas, Gomer Reese, George B. Pryde, William Moorhead, G. A. Knox.

Anthracite District—A. B. Jessup, H. D. Kynor, D. E. Ingersoll, B. C. Osler, T. D. Lewis, B. H. Stockett, John Conlon, S. D. Dimmick, and E. H. Suender.

Mining Exposition

CHARLES C. WHALEY, of the Myers-Whealy Co., of Knoxville, chairman of the Manufacturers Division, and L. W. Shugg, of the General Electric Co., of Schenectady, director of exhibits, have had the active cooperation of the officers and members of the division in arranging the details for the machinery exposition, including Ralph C. Becker, of the McGraw Hill Co., of New York, and John T. Ryan, of the Mine Safety Appliances Co., of Pittsburgh, vice chairmen of the division. They re-

and

EXPOSITION



CHAS. C. WHALEY
Chairman,
Manufacturers
Division

port that many companies have already arranged to exhibit their latest products at Cincinnati, and that others will be represented in the exposition halls before the convention opens. Exhibits will include products of the following companies: American Steel & Wire Co., Bethlehem Steel Co., Inc., The Brown-Fayro Co., Carnegie Steel Co., Chicago Pneumatic Tool Co., Cincinnati Frog & Switch Co., Cincinnati Mine Machinery Co., Condon Bearings & Supply Co., Deister Concentrator Co., Duncan Foundry & Machine Co., DuPont de Nemours & Co., Edison Storage Battery Co., Electric Railway Equipment Co., Electric Railway Improvement Co., Electric Storage Battery Co., Fairmont Mining Machinery Co., General Electric Co., General Steel Castings Co., Goodman Manufacturing Co., Hendrick Manufacturing Co., Hulburt Oil & Grease Co., Hercules Powder Co., Hydrotator Co., Jeffrey Manufacturing Co., Joy Brothers, Inc., Joy Manufacturing Co., Koppers Rheolaveur Co., Leschen & Sons Rope Co., Link Belt Co., Lorain Steel Co., McGraw Hill Co., Macwhite Co., Mine Safety Appliances Co., Mining Safety Device Co., Myers-Whaley Co., National Carbon Co., National Malleable & Steel Castings Co., Niagara Concrete Mixer Co., Ohio Brass Co., Portable Lamp & Equipment Co., Post Glover Electric Co., Pure Oil Co., Roberts & Schaefer Co., Robinson Venti-

lating Co., John A. Roebling's Sons Co., Safety Mining Co., Simplex Wire & Cable Co., Streeter-Amet Co., Sullivan Machinery Co., Timken Roller Bearing Co., Tool Steel Gear & Pinion Co., The W. S. Tyler Co., Tyson Roller Bearing Co., Universal Lubricating Co., Weir Kilby Corp., Westinghouse Electric & Manufacturing Co., and West Virginia Rail Co. The United States Bureau of Mines and the National Safety Council will also have an exhibit.

THE FOLLOWING well known figures in the coal industry have accepted invitations to act as presiding officers of the sessions of the convention: P. C. Thomas, vice president, the Koppers Coal Co.; J. D. Zook, president and commissioner, Illinois Coal Operators Association; W. J. Jenkins, president and general manager, Consolidated Coal Co. of St. Louis; Dr. L. E. Young, vice president, Pittsburgh Coal Co.; E. W. Judy, vice president and general manager, Duquesne Light Co.

Practically all of the papers to be delivered before the convention will be by practical coal operating men, while former Governor Flem D. Sampson, of Kentucky, who conducted numerous conferences while chief executive of the Blue Grass State, to stabilize the coal industry, will contribute a paper on the

economic phases of the industry under the title "The Real Coal Problem."

Entertainment Features

SECRETARY J. F. CALLBREATH, of the American Mining Congress, and E. R. Coombes, secretary of the Manufacturers Division, are giving considerable attention to the details of the convention and exposition in cooperation with the program committee and Manufacturers Division executives. In addition to the regular convention sessions a meeting will be held of the recently organized Coal Mining Division of the American Mining Congress which will consider further reports on the development of modernized mining methods in the coal industry.

Delegates to the convention for whom a special railroad rate of a fare and a half for the round trip good for 30 days has been secured, will find opportunity for social diversion, arrangements for which are being made. These will include special luncheon meetings for various groups, including a complimentary breakfast to Chairman McFadden, of the program committee; a golf tournament, National League baseball, and an opportunity to witness the Kentucky Derby at Louisville the afternoon of May 7.

PRACTICAL OPERATING MEN'S DEPARTMENT METALS

Practical Operating Problems
of the Metal Mining Industry

GUY N. BJORGE, Editor

Metal Pipe and Flexible Tubing in Auxiliary Ventilation of Metal Mines*

by
Oscar A. Glaeser†
and
S. H. Ash‡

THERE ARE MANY places in metal mines and tunnels where a properly selected and utilized ventilating system can eventually prove to be not only economical, but also of maximum safety and efficiency in the operation of a mine as a whole or of the individual part.

As a rule, more or less long established usage decides the selection of the ventilating system, and often this fact accounts for delay, extra costs, and unfortunate experiences. This is especially true in auxiliary systems.

Good ventilating practice in many mines requires that even the auxiliary systems be reversible, and this requires that there should be two independent but connected passageways, or that non-collapsible tubing be used if tubing is installed. This report deals chiefly with the use of tubing.

Generally, a blower system is favored, and often it must be used for mitigating the ill effects of high temperatures at faces; for other ventilation in raises, gases could be more effectively kept out by exhaust systems, assisted by compressed air or blower units in the face section. Collapsible tubing could not be used in such cases, and reversible systems have a distinct advantage in that they eliminate fire hazards involving smoke and hazards from explosive or poisonous gas.

Frequently not only does the question of cost enter, but also reasonable safety and efficiency of

operation are definitely involved. In this particular phase of auxiliary mine

operation as one which has not been used locally but possibly has had good results elsewhere.

Auxiliary Ventilation Factors

Auxiliary ventilation of dead ends of drifts in metal mines, and in the boring of tunnels, both large and small, and for various other purposes, has become an important phase of the driving operation. In tunnel driving the practice has become more or less standardized, but in metal mines efficient operation of auxiliary ventilating equipment has had relatively little attention. The type of fan used and the size and construction of air ducts employed in many instances are wholly unsuited for the work.

The question most frequently asked relative to auxiliary ventilation is: Shall metal pipe or flexible tubing be used, and which is cheaper?

It is generally assumed that metal pipe is more lasting and probably far cheaper in the long run than the flexible tubing. Equipment and installation cost, deterioration and maintenance taken together with effectiveness in the delivery of air, should be the determining factors as to the choice of air duct. These factors are largely controlled by conditions under which the equipment is used. A tabulation of some favorable and unfavorable factors, as taken from experience, for metal and canvas or flexible tubing follows at foot of next page.

From this tabulation it would seem that the advantages and disadvantages are about equally distributed, de-

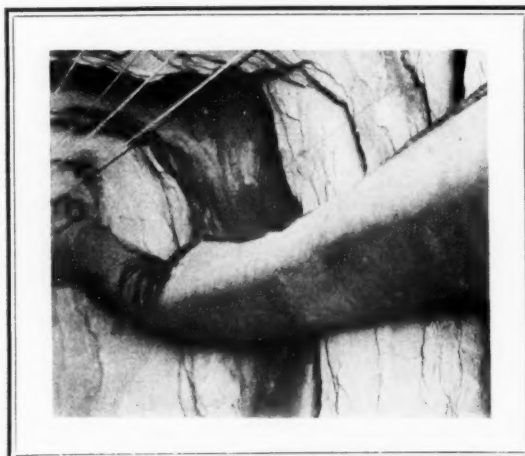


FIGURE 1

A good method of supporting collapsible tubing near the face. A $\frac{3}{8}$ -in. cable is stretched tight and fastened at the ends only. Support between ends is in the form of hooks. The tubing is wired to the cable loosely as shown. At blasting time it is pushed back from the face and bunched. To get air to the face after blasting, one man grasps the end of the tubing and walks to the face. The cable can be hooked up later when the drift is clear.

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‡ District engineer, U. S. Bureau of Mines Safety Station, District I, Berkeley, Calif.

ventilation the selection of ventilating equipment is very important and sometimes the customary method is by no means as desirable or as safe or as effi-



FIGURE 2

An efficient collapsible tubing installation. The water pipe was installed so that it could be used for tubing support. This method produces a relatively straight, efficient air duct.

will considerably raise the footage cost of installation of auxiliary ventilation with use of metal tubing.

Five hundred feet of 16-in. canvas tubing can be conveniently carried on a narrow-gage mine truck; one man can handle it in a few minutes. A maximum of 5 lengths of 16-in. pipe with assembled length of not over 80 to 100 ft. can be loaded on the same truck, but two men would be required to do the loading. The transportation of metal pipe in the mine is also frequently a source of annoyance; not only to those who are handling the pipe but also to those engaged in other mine operations such as timbering, haulage, etc.; often little available storage space exists



FIGURE 3

A poor and inefficient installation of flexible tubing. Sagging wire with only an occasional hook-up of tubing gives poor results, such as restricted air passage, torn tubing, and excessive wear due to cars scraping along the lower side of the tubing.

pending entirely on the nature of the operation, the advantages are decidedly in favor of metal pipe on long lines and high-pressure systems. The driving of long drifts or tunnels is not, however, usually a major problem in the day by day operation of a well-established mine and will therefore receive no more consideration in this paper.

A definite advantage is held by flexible tubing in storage, transportation, handling, installation, and repairs. In relatively short lines there is a distinct advantage for flexible tubing in the matter of leakage in typical installations. Furthermore, these are unquestionably the efficiency-determining factors, if the capacity of the ventilator is ample.

When installed and subsequently handled with reasonable care canvas or other flexible tubing gives excellent service and a minimum of leakage loss. Careless handling, however, quickly reduces such an installation to the point of absolute ineffectiveness.

Metal pipe requires much more labor to install, and if a reasonably air-tight job is desired, more labor is required for calking and wrapping the joints. Handling and transportation labor is also an item which, if charged to ventilation,

underground so that pipe is brought in only as needed; if several lengths are installed at any one time, tramping or haulage is likely to be interrupted; all of these items must be taken into consideration if a true comparison of ultimate cost is to be made as between the two types of tubes for conducting air.

Installation

Installation is an important labor item and one of the determining factors in selecting a system. The smaller the pipe, the more of it that can be placed per shift. Two men are able to install about 200 ft. of 8-in. light galvanized-iron pipe in one shift; on the other hand, two men can hang in the same length of time at least 400 ft. of 8-in. canvas or similar flexible tubing. After being suspended there is essentially nothing further to be done to the flexible tubing, but if a reasonably air-tight job is desired of the metal pipe, the joints will probably have to be wrapped and otherwise treated, requiring another shift.

In larger diameters up to about 16 in. it is possible under good conditions for 2 men, using practically new pipe, to in-

stall about 150 ft. of metal pipe in one shift. If, however, the pipe has been used before and had only average treatment, the ends are very likely to be battered and the pipe sprung. Much time is then required to make the joints fit, and the length installed during the shift will be reduced to perhaps 100 ft. or less. About 20 pipe joints can be wrapped and painted by one man in an 8-hour shift. Two men can hang about 250 ft. of 16-in. canvas tubing in a shift in an ordinary-sized metal-mine drift. All of the time studies from which data are given include drilling holes for hangers, putting in the hangers, and wiring the metal pipe; in the case of collapsible or flexible tubing the cost data also include stretching wire from which the tubing is suspended.

One metal pipe installation cost factor is material used in wrapping joints, which amounts to 4 to 6 cents per joint. Wire consumption and cost for suspension are approximately the same for either type of installation.

The foregoing comparisons have been made only where extensive lines can be installed at once. In keeping pace with daily progress, metal-pipe installations are relatively more costly because more handling is required and there is likely to be more interference with mine operation than when flexible tubing is used. Where operations are distributed over 10 to 15 levels 2 men can ordinarily maintain extensions on about fifteen 16-in. collapsible tubing installations; in addition, they will usually have time to hang some tubing in new places, remove tubing from finished drifts, and repair or replace torn lengths.

Two men can keep 16-in. ventilation pipe extension to the faces of about 8

Metal Versus Flexible Tubing

Condition	Metal	Flexible
Exhaust system	Favorable	Unfavorable
High-pressure systems	Do.	Do.
Long lines with a number of boosters	Do.	Do.
Permanent installation	Do.	Do.
Storage, transportation, and handling	Unfavorable	Favorable
Installing	Do.	Do.
Capacity	Usually better for metal	
Leakage losses	About the same	
Temporary installations	Unfavorable	Favorable
Heavy blasting	Favorable	Unfavorable
Long life	Do.	Do.
Repairs	Unfavorable	Favorable

drifts if they are industrious and if conditions, in general, are favorable.

Pipe and Tubing Material

Zinc-coated iron is most commonly used as metal tubing or pipe; it ranges from 22 to 14 gauge, depending upon size of pipe and mining conditions. In mines where drifts are small and blasting relatively light, 8 to 10-in. pipe of 20-gauge will probably stand up well; where drifts are larger or where the rock is difficult to break and heavy blasting is necessary, 12 or 16 in. pipe of 16 to 14 gauge ore are likely to be found most suitable. If some doubt exists as to size of pipe to use it is wise to err on the side of the larger diameters. Collapse of pipe is common, particularly at elbows and Y connections due to blast concussion, especially when light material is used; 20-gauge metal is considered too light for 16-in. pipe.

Canvas tubing can be purchased in several weights and grades; the canvas-treated material is high-grade tubing and costs accordingly. There is also on the market a jute-treated material which has good wearing qualities and is considerably cheaper than the canvas. It is probable that tubing rarely wears out; its deterioration is generally due to abrasion or other mistreatment, and the jute type "stands up" at least as well as the canvas and the cost is less.

Pipe Joints.—The common method of joining lengths of pipe is by crimped or stovepipe slip joint; this type permits of 10 to 15 degree bends per joint, depending on the crimp. Pipe with stovepipe joints becomes difficult to put together when sprung or when the ends are battered, and to make a joint of this type reasonably tight it must be wrapped and painted. Some mines use a metal clamp which is bolted in place on top of the wrapping, thus insuring a practically tight joint. Another method, but one less commonly used, is to bell out one end, and to make such a joint tight it must be calked and wrapped; this permits a wider range of joint bends and the calking assures a fairly tight joint. Wood-stove pipe has been used in tunnel work on high-pressure lines because of the natural tightness of joints, and where acid mine water or air is troublesome; however, wood pipe has disadvantages for ventilation and is not much used for such purposes. The corrosive effects of acid conditions on metal pipe can usually be minimized to some extent by painting the pipe inside and outside with slaked lime and spraying the heading region at regular intervals.

Life of Pipe and Tubing

Metal pipe in place lasts more or less indefinitely, with the exception of possible corrosion, but when subjected to

falls or too frequent handling it readily becomes battered and sprung, and eventually ruined for further use. Excepting for corrosion, a piece of galvanized iron pipe will perhaps withstand the wear of 10 to 15 installations, depending on the care taken in handling it. Canvas tubing will also wear for long periods if it is properly cared for; unfortunately, it usually does not receive careful treatment, and naturally it can not resist rough handling as well as iron pipe. If tubing is subjected to atmospheres which tend toward rapid deterioration from decay, sections should be removed periodically and "aired out"; replacements of these sections are not costly, as they are generally local, and a 50-ft. section usually can be replaced in a few minutes. Tubing not subjected to the effect of fly-

supporting object; it is usually hung in as straight a line as conditions permit. Canvas tubing can be supported in several ways, one of the poorest of which is the occasional suspension of the tubing from a pipe hanger; hooking the tubing to a loose wire so that it hangs in loops is inefficient and causes loss of capacity; suspending it from a tightly-strung 12-gauge wire, or fastening it to the water or air pipe where these are well up out of the way, or suspending it from a cable 150 to 200 ft. long with special supports between ends, as shown in Figures 1 and 2, are the more satisfactory ways of hanging tubing. Suspension from a cable is particularly well adapted to conditions where tubing has to be moved back long distances from the face. Figure 3 shows a poor method of hanging flexible tubing.

Cost of Typical Installations

(Example A)

To purchase, install and remove 1,000 feet of air duct:

Item	16-inch Jute Tubing	16-inch 14-gage iron pipe
Material cost	\$610.00	\$860.00
Transportation	2.00	20.00
Labor—hanging 8 man-shifts	36.32 14 man-shifts	68.56
Labor—wrapping joints	5 do	22.00
Completed work	\$648.32	\$965.56
Loss—depreciation, destruction, etc., 20%	122.00 5%	43.00
Removing—2 man-shifts	9.08 6 man-shifts	27.24
	\$779.40	\$1,035.80
All labor and transportation costs for flexible tubing	\$47.40 or 4.74 cents per foot	
All labor and transportation costs for metal pipe	\$132.80 or \$13.28 cents per foot	
Net saving in use of jute tubing		\$256.40

(Example B)

Assume that during a 12-month period 15,000 feet of duct is installed.

Item	16-inch Tubing	16-inch Pipe
	Total Per foot, cents	Total Per foot, cents
Labor	\$711.00 — 4.74	\$1,992.00 — 13.28
Depreciation and shrinkage 20%	1,830.00 — 12.20	645.00 — 4.30
Material	9,150.00 — 61.00	12,900.00 — 86.00
	\$11,691.00 — 77.94	\$15,537.00 — \$1.0358

ing rocks or to undue abrasion from haulage or other equipment should, if properly handled, remain in good condition for a number of years even if in that period it has to be moved many times. A few of the reasons for the short life of tubing are: (1) willful cutting of holes into tubing to obtain moving air for cooling effect; (2) neglect to remove it at blasting time; (3) pulling it down without any attempt at unhooking; (4) dragging it along the drift over sharp rock; (5) leaving it lying on track and tramping over it; (6) walking over it while it is lying on ground; and (7) splitting due to concussion. The latter generally happens only if the fan is permitted to run during blasting. These causes can all be overcome by careful handling, and much of this abuse can be avoided by good supervision.

Methods of Support.—It is general practice to support air ducts from the roof, and with metal pipe this is usually accomplished by wiring the pipe to some

An analysis of three items—labor, shrinkage, and material—indicates a labor saving of \$1,281, or of 8.54 cents per foot, by using canvas tubing. A saving of \$1,185, or of 7.9 cents per foot, is indicated in shrinkage if metal pipe is used. This, however, is more than offset by the labor item if flexible tubing is used. On the other hand, if tubing is handled carelessly the saving in favor of metal pipe would become much greater. However, it should be entirely possible to reduce canvas-tube consumption below 20 percent, the figure used in these calculations. With careful handling the cost of flexible tubing could easily be cut 5 cents per foot of advance.

The material cost or investment figures show the greatest difference in favor of the flexible tubing; a saving of \$3,750 is indicated. This is net, since the relatively high cost in tubing is offset by the greater installation cost of metal pipe.

PRACTICAL OPERATING MEN'S DEPARTMENT

COAL

Practical Operating Problems of the
Coal Mining Industry

NEWELL G. ALFORD, Editor

MECHANICAL LOADING with SCRAPER LOADERS at WASSON COAL COMPANY'S MINE NUMBER 1

By

L. A. Wasson

Assistant General Manager

THE SELECTION of mechanical loaders for any particular condition is a problem which must be given a great deal of thought since no existing loader will satisfy all conditions. It was with this in mind that we started an investigation early in 1925 to find the apparatus best suited for certain sections in our No. 1 mine.

The No. 5 Seam in Saline County, Ill., has variable characteristics with coal varying in thickness from 48 to an approximate 84 inches. Some sections are very hilly while others are flat. In other words, mines operating in this seam usually have three or four different kinds of conditions which would, if a mine were organized mechanically for the best efficiency, necessitate three or four different types of mechanical loaders.

The following are some of the factors which governed our selection and which always enter into the choice of loading machines:

1. Height of seam.
2. System of mining.
3. Width of place.
4. Condition of top and bottom.
5. Distance timbers can be set from face or rib.
6. How the coal shoots.

7. Possibilities of lump.
8. Clearance between top of mine car and roof.

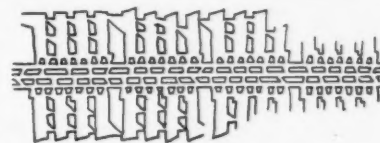
The above, of course, represent the physical properties of the coal seam itself but it should also be remembered that the loader is not an independent unit but one which is affected by all operations in the mining or preparation of coal, haulage, or lack of it, being considered by many the most important. While it is not my intention to discuss the relative importance of the different phases in loading operations, I would suggest that lack of proper shooting, cutting and any of the other steps necessary to the production of coal will more or less have the same effect.

WITH THESE IDEAS in mind and after due deliberation and investigation by our organization the Goodman Type 136 self-propelling and self-contained scraper loader was chosen.

This loader has the ability to load and transport the coal to the entry where the scoop discharges into the mine car.

cleaned by the loader crew, leaving clean coal for the scraper and the market.

We have tried many different systems, such as slabs 200 ft. in length, rooms with a straight face 50 ft. in width and variations of both of these systems. After some experimentation we decided the room and pillar method with a three entry system of haulage was the best solution for our particular problem.



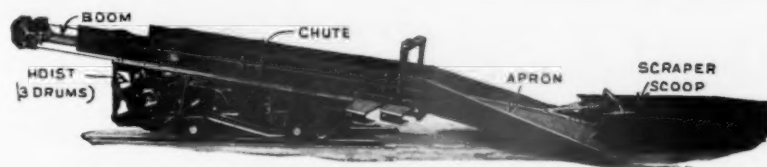
Sketch of Mining System

The scrapers produce very cheap coal on slabs but since the matter of subsidence is a very important factor in our state (Illinois) we were loath to take any chances on a system which might eventually involve the above.

The scheme we now follow is to use the two scraper loaders in the same section, which gives us concentration, as one mining machine is able to cut for the two scrapers.

THE HAULAGE SYSTEM, which to a certain extent is solved by this loading device itself, is further augmented and made more efficient by the use of the three entry system which enables each unit to obtain its supply of cars without delaying the other.

The winding engines are set in the room necks and deliver their coal to the cars, which are placed in the entry next to the working place, the center entry being used as a passing track. The trip of empties is placed above or below the loader, this being governed by the grades. The car dropper feeds the cars past the winding engine (Continued on page 33)



Goodman Loader, Type 136

The coal in the section where the scraper loader operates varies in thickness from 48 to 60 inches, with from 4 to 18 inches of draw slate which comes down when the coal is shot and lies on top of the coal. This draw slate, which breaks up in large chunks, is readily

NEWS

of the mining field

Changes in Steel Company Planned

At the annual meeting of United States Steel Corporation stockholders, scheduled to take place on April 18, several important changes will be announced in the executive personnel.

Mr. James A. Farrell, the retiring president, will be succeeded by Mr. William A. Irvin, who has been associated with United States Steel subsidiaries for more than 30 years. The announcement of Mr. Irvin's election did not definitely state that he was to be the chief executive officer as well as president, although Mr. Farrell has held both titles since the latter part of 1927.

Mr. William J. Filbert, controller, will be promoted to vice chairman of the Finance Committee, and Mr. Walter S. Gifford, conspicuous for his successful administration of affairs of American Telephone, is an addition to the same important committee.

There have also been a few less prominent changes.

Commerce Service

A new booklet issued by the Department of Commerce on its activities states that its promotion service is to assist the mining industry to eliminate waste and to safeguard lives. Reviewing the work of its Bureau of Mines, the report says the Bureau is endeavoring to supply the need of the industry and of the public for better information concerning the characteristics and uses of the different fuels and their products. It is stated that the Bureau has pointed the way to the efficient utilization of the country's enormous lignite resources by developing carbonizing and briquetting processes. Mine management and accounting control are being investigated by the Bureau, and it is stated that the outstanding position of Utah as a lead and zinc producer is due in part to improvements in metallurgical practice which the Bureau helped to develop. Reference is also made to the work of the mineral divisions of the Bureau of Foreign and Domestic Commerce.

Philippine Mines

The War Department reports that \$3,965,000 is invested in mines in the Philippine Islands, of which \$2,609,000 is by Americans; \$647,000 by Filipinos; \$370,000 by British; \$136,000 by Chinese; \$87,000 by Spanish, and \$116,000 by other nationalities.

Personals—



The members of the American Mining Congress will be greatly pleased to learn that Mr. Harry N. Taylor has been elected to the Board of Directors and as a member of the executive committee.

Probably no man in the coal industry has had a wider and more varied experience. Few have been in the business for so long a time and no man in the industry has more carefully studied its problems nor has commanded greater respect for his accomplishments.

Mr. Taylor brings to the Mining Congress a long experience in public relations and association activities.

W. MONT. FERRY and HENRY M. RIVES, president and secretary of the American Silver Producers' Association, are in the East. They attended the Silver Producers' meeting in New York City on February 19, and are taking part in the deliberations of Congress with regard to recommendations for the silver problem.

GEORGE PAULL TORRENCE was elected president of the Link-Belt Company at its annual meeting of stockholders on March 22.

Mr. Torrence was graduated from Purdue University, class of 1908, and has had 21 years' experience in various departments of the company which he now heads.

Coal operators were in Washington last month in connection with the hearings before congressional committees on the coal regulation bill. Among these were Messrs. Marshall John H. Jones, of the Associated Coal Corporation, of Pittsburgh; Chas. F. Hosford, Jr., president of the Butler Consolidated Coal Company; Howard W. Showalter, president, Continental Coal Company; John L. Hatfield, president of the Rosedale Coal Company, and A. B. Abbott, president of the National Coal Distillation Corporation.

FRANK M. SMITH, of Spokane, Wash., has been elected as president of the Northwest Lead Company. Mr. Smith is also smelter director for the Bunker Hill and Sullivan Mining and Concentrating Company at Kellogg, Idaho, which controls Northwest Lead.

MR. FLEM D. SAMPSON, attorney, and ex-governor of Kentucky, was in Washington last month and on March 22 testified before the subcommittee of the Senate Mines and Mining Committee on the coal regulation bill.

State Mine Reports

The Nevada Bureau of Mines issued a report on the ore deposits of the Gold Circle mining district in Elko County, Nev.

The Colorado School of Mines issued a report on the application of a gasometric method for the determination of oxygen in coals.

The Ohio State University Engineering Experiment Station issued a report on steel foundry practice and on tests on the continuous carbonization of finely crushed coal from Ohio, West Virginia and Illinois by radiant heat.

The Connecticut Geological Survey issued a report on the minerals of that state, of which there are said to be 100 kinds.

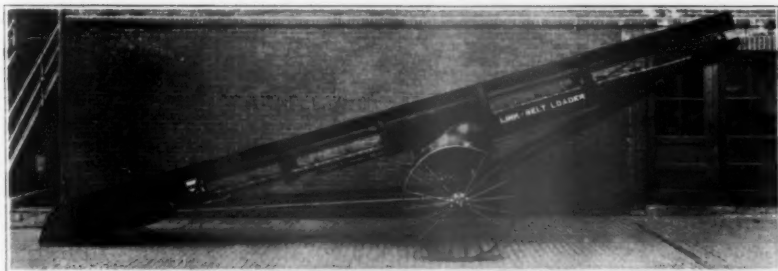
Obituary

George Nicholson, vice president and assistant general manager of Vulcan Iron Works, died suddenly in his office on March 15, when stricken with a heart attack. He was 61 years old.

Mr. Nicholson had been connected with the Vulcan Iron Works Company for 43 years and his attainments in the development of mining machinery have been of value and interest to the industry as a whole.

With the MANUFACTURERS

NEW LINK-BELT PORTABLE FLIGHT CONVEYOR



In broadening the scope of their portable conveying machinery line, Link-Belt Company, Philadelphia, Pa., have brought out the Link-Belt "Bituminous Type" portable flight conveyor. This machine is especially adaptable to the handling of bituminous coal, coke and other lumpy materials, as well as fines:

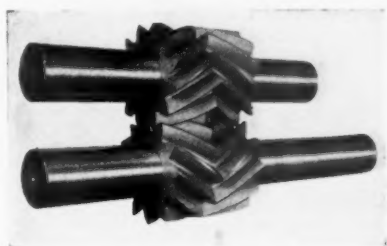
The length of the conveyor is 21-ft., 26-ft., or 31-ft. centers, with a capacity of 90 tons of coal an hour with uniform

feed, for 26-ft. and 31-ft. conveyors; 60 tons an hour for 21-ft. machine. The drive is a 5-hp. (or 3-hp. on 21-ft. centers conveyor) ball bearing electric motor, with fused safety switch, or gas engine if desired.

Complete specifications and illustrations of this conveyor are contained in Folder No. 1194, which may be obtained free upon request of the Link-Belt Company, 2045 West Hunting Park Avenue, Philadelphia, Pa.

A new type of pneumatic feed for rock drills in connection with line drilling or channeling work is announced by the Sullivan Machinery Company. The combination of the drill and feed presents several points of novelty and increased convenience, drilling speed, etc., which are described in their Bulletin 87-J.

Farrel-Sykes Herringbone Pinions Used As Pump Rotors



The application of Farrel-Sykes gears to large capacity pumps has recently become general. The gears shown in the illustration run at 435 r. p. m. and pump 625 gallons per minute against a head of 200 pounds. A pump of this kind makes a simple and efficient installation. It is very small for its capacity, no reduction gears are required, and it is consequently economical to manufacture.

Farrel-Sykes pump rotors are made in a variety of material, including bronze, high carbon forged steel, nickel-alloy cast iron, and various alloy steels including Nitroalloy. The gears made in this last named material are of great advantage.

Series On Industrial Lubricants

Beginning in April, the Standard Oil Company (Indiana) will publish each month a technical monograph on the lubrication of some type of equipment. The company states they have found that many plant men have expressed the desire to have specific authoritative information on the proper lubrication of various types of machinery.

The plan is to go through the whole line of the more important industrial equipment, making each lubrication discussion simple, brief and informative. No recommendations for any particular brands of lubricants will be made. The company feels such statements might savor of prejudice which will defeat the purpose of giving unbiased technical information. Requests for these monographs should be addressed to the technical division, 910 South Michigan Avenue, Chicago.

Cromaloy Flux

Cromaloy Flux, one of the important items in the line of Oxweld welding fluxes distributed by The Linde Air Products Company, has been developed especially for use in welding the chromium-containing alloys more generally known commercially as stainless steels or rustless irons.

Because of the excellent corrosion-resisting properties of these chromium-iron alloys, they are being used more and more extensively, and welded products in constantly increasing variety are being fabricated from these alloys.

The ordinary fluxes used for welding

or brazing are not satisfactory in welding stainless steel or rustless iron because they will not dissolve the infusible oxides, consisting chiefly of chromium oxide, which tend to form on the molten surface of these alloys.

Because of its high solvent power for chromium oxide, and its high resistance to heat, Cromaloy Flux is especially prepared for this type of work, and its use will insure best results in welding these special chromium-iron alloys.

Multiple "V" Belt Patent Suit Settled

The suit between The Allis-Chalmers Manufacturing Company and the Dayton Rubber Manufacturing Company, of Dayton, Ohio, in United States District Court at Cincinnati, Ohio, involving patent infringement of Allis-Chalmers Geist patent No. 1,662,511, pertaining to multiple "V" belt drives, has been settled out of court. The Dayton Rubber Manufacturing Company takes a license under the Geist patent and the Allis-Chalmers Manufacturing Company has the right to operate under Short patent No. 1,538,303, if it so desires.

Building Up Jaw Crushers With Hascrome



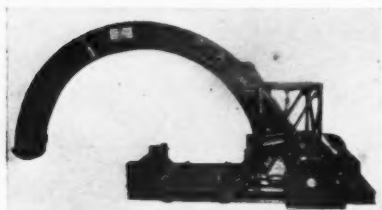
One steel mill in the Middle West recently found it possible to reclaim worn jaw-crusher plates at a considerable savings by rebuilding and hard-facing.

Fabricated from manganese steel, these plates had rapidly worn away and soon required replacing. This resulted in the scrapping of an appreciable amount of manganese steel each year. In order to diminish this loss the company rebuilt the plates in the manner shown in the accompanying illustration.

The plate is supported in a horizontal position, and a salamander is used during the building up process for preheating the part in order to prevent cracking. The worn ribs are then built up one layer at a time with Hascrome welding rod until a thickness of $\frac{1}{4}$ in. has been obtained. By applying the Hascrome in this manner more even distribution of heat is obtained, producing a good bond with the base metal and a minimum amount of warpage.

Further information concerning the use of Hascrome may be obtained from the Haynes Stellite Company, 205 E. 42nd Street, New York City.

Largest "Gooseneck-Type" Refuse Mine Car Dump Recently Installed



Largest dump, in position to receive cars for dumping

The Lamar Colliery Company, Algonquin, W. Va., has put in what is believed to be the largest "Gooseneck-Type" mine car dump ever installed.

The dump, built by the Link-Belt Company, Chicago, handles mine cars that weigh 21,000 pounds loaded and 6,000 pounds empty.

It is operated by a 30-hp. motor on a 230-volt direct current line. The tilting speed is 70 ft. per minute, which means that a car can be dumped approximately every two minutes. The machine is equipped with a cable and haulage drum, approach rails and discharge rails, so that it can haul the loads into the tilting cradle and discharge them after unloading.

Bulletin 85-RB of the Sullivan Machinery Company on "Bulldog" Safety Clamps for diamond drills describes a new development in core drill safety clamps designed to render improved service in handling rods in the hole.

Chicago Pneumatic Tool Company announced the appointment of the H. O. Penn Machinery Company, 140th Street and East River, New York City, as a sales agent. The products to be handled include portable and stationary compressors, rock drills, pavement breakers and similar CP pneumatic equipment.

For safe insulation of electrical parts the Jeffrey Manufacturing Company offer its No. 110 Insulating Paint. Easy to apply it is especially recommended for covering mica rings on end of commutators, metal and insulating parts of control cylinders, storage battery lugs, and insulating the inside of motor field frames, starting boxes, controllers, etc.

New Heavy Duty Vibrating Screens Announced By Link-Belt

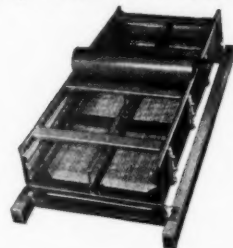
Two new types of vibrating screens have just been announced by Link-Belt Company. These screens are known as:

1. Link-Belt positive drive-type, heavy-duty vibrating screen, which is made with both single and multiple decks.
2. Link-Belt unbalanced-pulley-type, heavy-duty vibrating screen, made with single and multiple decks.

These two additions to the Link-Belt line of vibrating screens will be valuable to the industry where large screen openings are required and heavy capacities must be handled.

Folder 1262, giving dimensions, clearances, etc., will be sent free upon request to the Link-Belt Company, 2045 Hunting Park Avenue, Philadelphia, Pa.

Universal Vibrating Screen Company Offers New Catalog

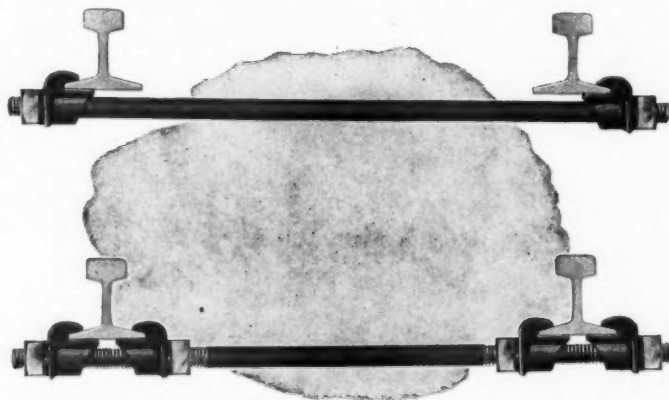


A new and interesting 32-page catalog, describing the latest model Universal Vibrating Screens in detail, has just been published by that firm. A copy will be gladly furnished, free upon request to the Universal Vibrating Screen Company, Racine, Wis., referring to Catalog No. 99.

Cleveland Rock Drill Company announce a distinct innovation in their Cleveland Type "Q" All-Steel Air Hose Coupling. Their Bulletin No. 107, containing a complete description of this improved coupling, will be sent free upon request.

The use of small African bortz for setting core drill bits, the development of "Round Shoulder" bits set with bortz and Sullivan "Readysset" bortz bit service to core drill users are described in Bulletin 85-RA of the Sullivan Machinery Company, of 400 North Michigan Ave., Chicago, Ill.

*Where it is difficult
to hold your track
to gauge.*



West Virginia Gauge Rods are for use on any track that is difficult to hold to gauge. They are especially valuable when installed on curves. Single jaw type will hold track to gauge. The double jaw type also braces rails against overturning. It is recommended that gauge rods be spaced approximately 12 ft. on medium curves and 6 ft. on heavy curves. Our catalog gives details of the three sizes as well as many further suggestions useful to any one concerned with track work. Write for it.

THE WEST VIRGINIA RAIL COMPANY

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*Rails and Accessories, Frogs, Switches,
Steel Ties and Special Track Work in
stock for prompt shipment.*

Safety at M. A. Hanna Properties

(Continued from page 16)

pound turkeys were given to the employees at two mines for completing 12 successive months without a lost time accident. Since that time, turkeys, pocket knives, flour and silk mufflers have been given to the men for similar records.

Believing that safety work should be brought into the homes of our employees and that "a picture is better than a thousand words," the company purchased a 35 mm. Holmes Portable Projector for use in conducting community safety meetings.

Safety meetings are held for the school children from time to time at the close of schools in the afternoon. The program consists of a short talk on safety, the showing of a picture on safety, and closing the meeting with a good two-reel comedy. This helps to advertise the evening community meetings which are held at some properties for the employees and their wives, when a similar program is held with the addition of another safety picture. At one property a dance is held at the conclusion of the meeting, a local orchestra furnishing the music. There were 32 meetings held from February, 1929, to May, 1930, with a total attendance of approximately seven thousand people.

Employees' monthly safety meetings were held at some of our properties previous to November, 1929, but at that time instructions were given to all superintendents that these employees' meetings were to be held regularly every month. A safety committee, made up from the regular mine employees, makes an inspection trip through the entire property, surface and underground, once a month, and reports their recommendations at the employees' monthly meeting. At these meetings, the accidents are discussed and the men called upon for safety suggestions. These suggestions, if practical, are carried out as soon as possible. The minutes of the meeting are furnished the safety engineer, the superintendent and management. From January 1, 1930, to December 1, 1931, there were 207 meetings held and 2,107 recommendations made by the employees. We believe that this is the most important activity in our accident prevention work.

Our mines are supplied with the Elliott bulletin board service. This service is of great assistance in bringing safety messages to all employees, and keeping safety constantly before them. The board is designed for the Elliott posters with a daily change of the News Photo poster and a change of the safety poster and the production and efficiency poster every three days. We also use

the board to display National Safety Council safety posters, local posters, honor roll, announcements, newspaper clippings of accidents at other mines, broken goggles, etc.

Classes in mine rescue training are held every three months in normal times. We have three eight-man teams in the Iron River District and one five-man team on the Mesabi Range.

We have just recently gone into the 100 percent first aid training and eventually we hope that all properties will possess a 100 percent first aid certificate from the U. S. Bureau of Mines.

Flag poles have been erected at all of the Michigan properties. A safety flag is flown beneath the American flag until the mine has a lost-time accident, when it is taken down and not put up again until the first day of the following month.

Steel signs which show the number of consecutive days without a lost-time accident are displayed at all properties.

The methods mentioned are of great help in maintaining the interest in the safety work.

The safety work is influenced by the labor conditions. A study of these conditions was made in 1929. A total of 1,541 men were required, of which 720 were employed (Continued on page 32)



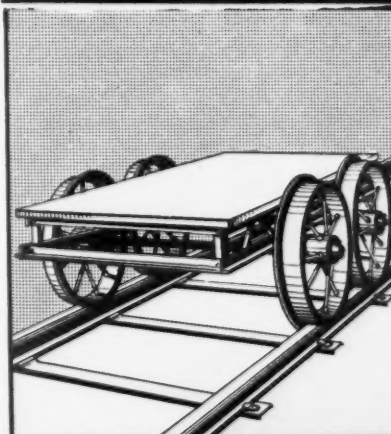
HOLMES -Coal Lowering Spirals store coal without breakage

Bulletin 63 explains their efficient economy. Holmes' line includes all handling equipment and complete tipplers

ROBT. HOLMES & BROS., INC., DANVILLE, ILL.

EGYPTIAN MINING EQUIPMENT

MINE CARS
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FOR MOVING
TOOLS, DRILLS
AND SIMILAR
EQUIPMENT
ABOUT THE MINE,
THE EGYPTIAN
PUSH CAR,
LIGHT-WEIGHT,
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CAN NOT BE
EXCELLED.

SEND FOR
DESCRIPTIVE
BOOKLET

EGYPTIAN
IRON WORKS
MURPHYSBORO · ILLINOIS

Safety at M. A. Hanna Properties

(Continued from page 31)

in the open pits and 821 employed underground. There was an average of 148 men hired monthly. This large labor turnover was due to the closing down of the open pits in the fall and the hiring of new men in the spring.

The nationalities of the employees in percent are as follows: Finnish 18.1, Italian 13.7, Swedish 13.6, Austrian 11.0, Polish 8.5, English 5.9, Croatian 4.7, and the balance is made up of 10 other nationalities. Forty-five percent of all employees are American born.

The medical service consists of a physical examination of new and old employees, hospital and dispensary service. First aid treatment is given for slight injuries at the mine and then injured is sent to the doctor for further attention if considered necessary.

The doctor and foremen make a report of the injury.

The company carries its own compensation insurance. The insurance rate varies with each property and is based upon the previous five years' accident experience at each property.

In our classification of a lost-time accident, the day of the injury is not counted as a lost-time accident. A man with a minor injury is allowed to return to work the day following the injury, providing he can do a day's work on a

job where he is not further endangered due to his injury. No jobs are allowed to be created to take care of the injured man.

Hazardous jobs require alert men. The same men are usually chosen to perform hazardous duties with which they are familiar. The foremen check up on a man's mental and physical fitness for hazardous jobs by observation of the man's past experience with them.

The improvement shown we believe is due to the methods outlined in this report; due to the full cooperation of the management; superintendents, mining captains and other foremen and also to the increased interest and effort in the safety work on the part of each employee.

The safety department consists of a safety engineer only. He inspects all properties, surface and underground, regularly and continuously, taking three weeks to make the circuit of the Michigan and Minnesota Ranges. He sees that all machinery is guarded properly; that safety regulations are being followed; watches for unsafe practices, unsafe conditions and fire hazards; checks up on hoisting cable inspection; sees that the safety catches on the cages are tested monthly; checks the condition of the second exits from the underground mines; looks for loose material and poor ladders. He holds classes in mine rescue and first-aid training and keeps the mine

rescue machines in good order; furnishes local material for bulletin boards; furnishes safety literature for safety meetings and assists in conducting safety meetings by safety talks and moving pictures.

New Aluminum Solder

A newly discovered aluminum and metal solder has been recently announced by the Allied Research Laboratories, of Glendale, Calif. The solder is called Alumaweld, and as the name implies, it fuses or welds with the metal to form a single piece.

Alumaweld will repair aluminum, pot metal, cast iron and steel quickly and lastingly, and is applied with an ordinary soldering iron or blowtorch. The solder melts at an exceedingly low temperature, but once it is applied, requires a much higher temperature to melt again.

The makers claim it is 10 times as strong as ordinary solder, quite ductile, and will take a nice polish over which chromium or any other plating can be applied.

"Norblo Continuous Operating Air Filters" is the title of a bulletin published by The Northern Blower Company, of Cleveland, Ohio. It describes details of construction and operation of their improved automatic and self-cleaning air filter.

CONNELLVILLE



CONNELLVILLE Sheaves have great strength and elasticity. They withstand heavy loads, shocks and stresses. Hub, spokes and main rim are cast in one piece. A hard, locomotive tire steel ring, made IN ONE PIECE fits over a turned position of the rim. A follower, bolted to the main rim, holds this ring in place. This sheave, under unusually hard service, will give 8 to 10 years of service. Steel rope will not cut or rough them. Rope will last longer than on soft steel or cast iron groove.

Bearings are weather proof, oil proof and collar oiling, with removable babbitted shell. Dirt and moisture are excluded. There is flood lubrication of all parts under all conditions. Their superiority has been proven under the worst possible climatic conditions. Send for details of this or any other type of mining machinery.

THE CONNELLVILLE MFG. & MINE SUPPLY CO.
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You want to know the resources of your bank. Why not inquire about the resources for service and research behind the company that supplies your explosives?



HERCULES POWDER COMPANY
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990 KING STREET, WILMINGTON, DELAWARE



A22-R

Mechanical Loading With Scraper Loaders

(Continued from page 27)

and when all are loaded couples them for a haulage motor preparatory to hauling to the main parting. This eliminates gathering and consequently frees the locomotive for other duties.

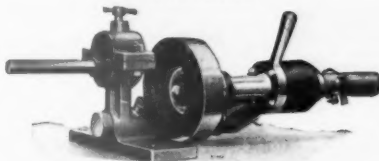
The winding engine or hoist and all the accessories on the loader are very rugged in design. Therefore, the maintenance cost is low and is made up mostly in the wear and tear on the ropes, sheaves and scraper.

THE CREWS on our loaders with few exceptions have been handling them from the start, consequently the knowledge gained by their experience also assists in keeping the maintenance cost low and in getting results. The men working on a loader usually contribute in large proportions to its success or failure.

In conclusion would say that in the choice of a loader it is essential that all factors be considered, both from a mining and mechanical standpoint. A good mining layout may be a failure due to improper choice of loading equipment, or a good loading machine made to fail due

to improper choice of a mining plan which does not conform to its particular method of loading. In my opinion with proper cooperation among all concerned there is no doubt of the success of mechanical loading which means reduction in cost and that is the final judgment it must pass.

New I.-R. Shank-Grinder Introduced



Ingersoll-Rand Co. announces the 4K Shank Grinder, a tool for facing the striking ends of drill steel shanks, rock drill and paving breaker pistons, and anvil blocks.

The machine consists of a "Multi-Vane" air grinder mounted in a frame so as to allow the grinding wheel to be passed back and forth by means of a handle. The grinder mounting is fitted with a wing nut adjustment working under spring tension for feeding the wheel up against the face being ground.

The steel or piston is held in a self-centering "V" block clamp incorporated in the frame. A countersinking bit is

located in the center of the grinding wheel for removing the burr from the hole in hollow drill steel. The complete machine can be bolted securely to the top of a work bench or other suitable location.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912.

OF THE MINING CONGRESS JOURNAL, published monthly at Washington, D. C., for April 1, 1932.

City of Washington, District of Columbia, ss:

Before me, a notary public in and for the state and county aforesaid, personally appeared R. S. Mowatt, who, having been duly sworn according to law, deposes and says that she is the assistant business manager of THE MINING CONGRESS JOURNAL, and that the following is, to the best of her knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in Section 411, Postal Laws and Regulations, printed on the reverse side of this form, to wit:

1. That the names and addresses of the publisher, editor, and business managers are:

Name of publisher, The American Mining Congress, Washington, D. C.

Editor, E. R. Coombes, Washington, D. C.

Business manager, J. M. Hadley, Washington, D. C.

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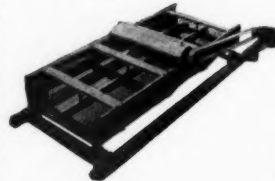
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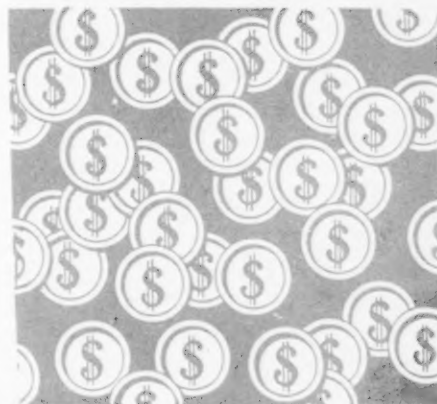
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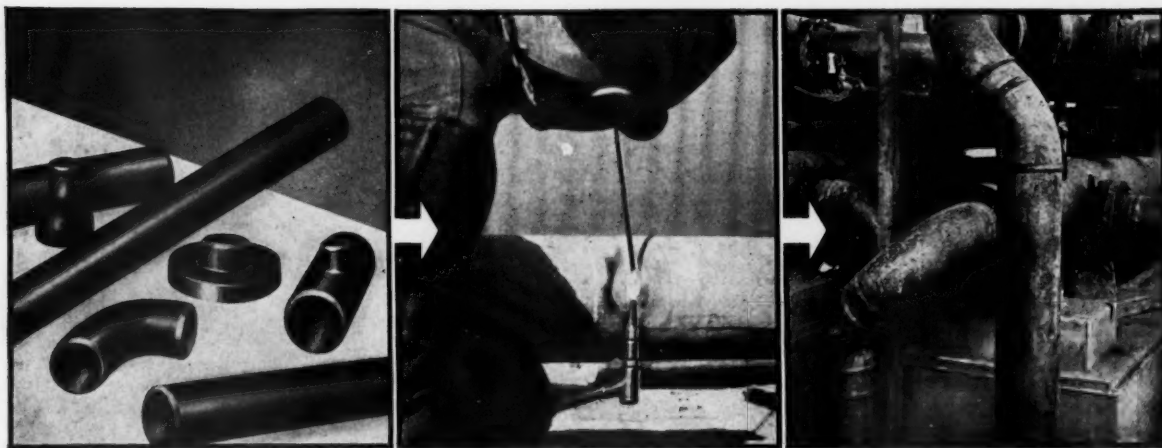
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